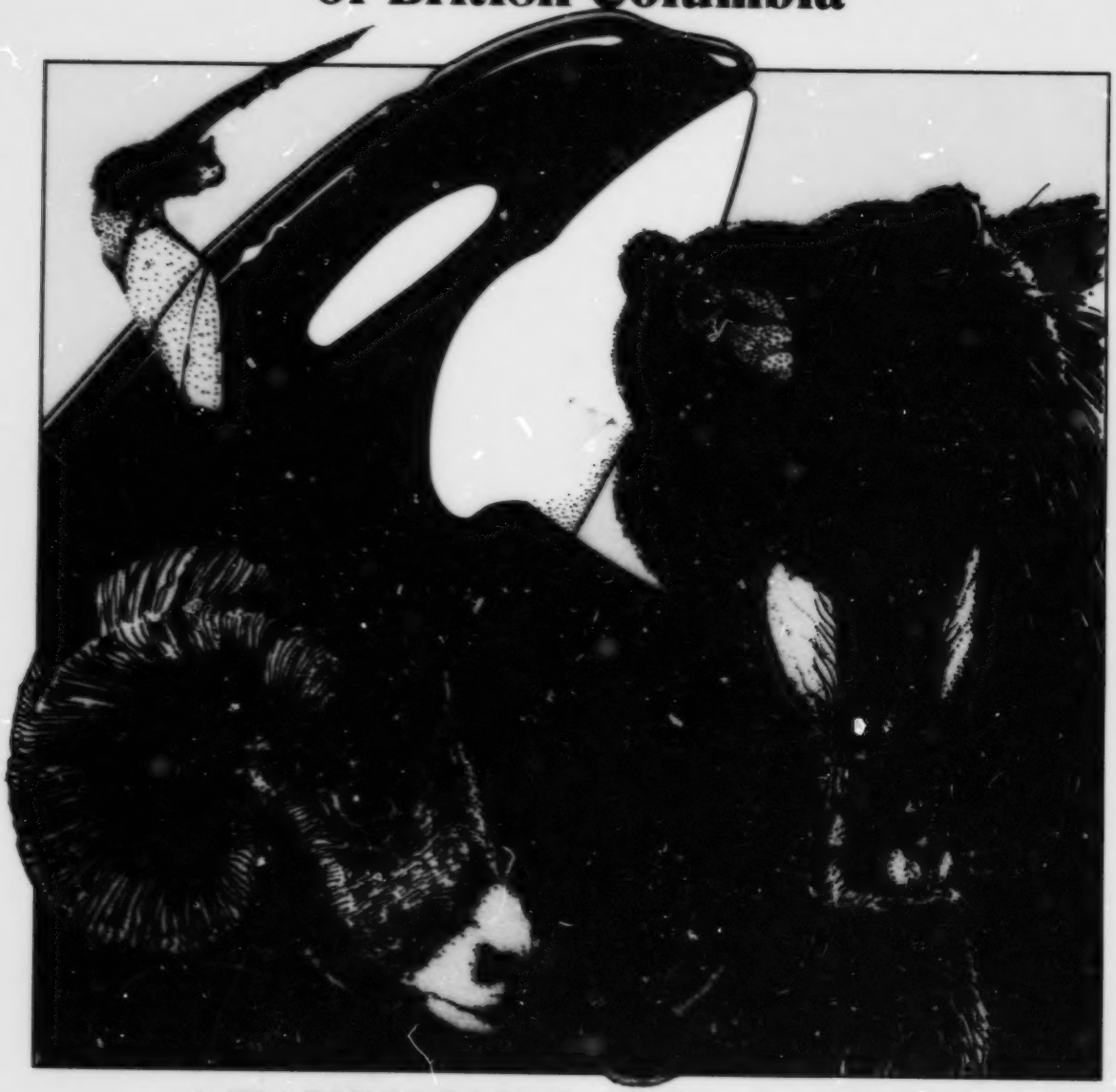
MEMOIR NO. 4
ROYAL BRITISH COLUMBIA MUSEUM

The MAMMALS of British Columbia



A TAXONOMIC CATALOGUE

David Nagorsen

91-02227/

The Mammals of British Columbia: A Taxonomic Catalogue

David Nagorsen

Errata

Page 4 — In the list of abbreviations for museums, add:
ROM, Royal Ontario Museum, Toronto

Page 43 — Line 2: Sullivan *et al.* in press should read Sullivan *et al.* 1990.

Page 90 — **Killer Whale**; SUBSPECIES; line 6: *O. orcinus* should read *O. orca*.

Page 111 — Add: Peterson, R.L. and S.L. Downing. 1952. Notes on the bobcats (*Lynx rufus*) of North America with the description of a new race. Royal Ont. Mus. Zool. Paleont. Contrib. 33:1-23.

Page 113 — In the citation, Sullivan, R.M., S.W. Calhoun and I.F. Greenbaum, add: 1990.

Page 138 — *Sorex*: **hoyi hoyi* should read *hoyi hoyi* (no asterisk).

Page 138 — *Sylvilagus*: *nuttalli* should read *nuttallii* and *nuttalli nuttalli* should read *nuttallii nuttallii* (note that **nuttalli* is correct).

Page 139 — Add:

Vespertilio
- **blossevilli*.....19
- **borealis*.....19
- **californicus*.....20
- **cinereus*.....19
- **ciliolabrum*.....20
- **evotis*.....21
- **fuscus*.....18
- **lucifugus*.....21
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- **pallidus*.....17
- **subulatus*.....21
- **volans*.....23
- **yumanensis*.....23

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MEMOIR No. 4
1990

The MAMMALS of British Columbia

A TAXONOMIC CATALOGUE

David Nagorsen
Mammal Curator
Royal British Columbia Museum

Province of
British Columbia

ROYAL
BRITISH
COLUMBIA
MUSEUM

Ministry of Municipal Affairs, Recreation and Culture
Hon. Lyall Hanson, Minister

WILDLIFE
BRANCH

Ministry of Environment
Hon. John Reynolds, Minister

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PREFACE

This publication began in 1982 as a simple checklist of species and subspecies names for British Columbia mammals. It was largely through the encouragement of Edward (Ted) Miller that it evolved into the present treatise. I thank Ted for suggesting the project and supporting it until completion. Harold Hosford and Gerry Truscott provided valuable editorial advice and moral support when needed. I am indebted to Erica Bates and Carolyn Kenzie for typing the numerous drafts of the manuscript and coping with the multitude of technical names. The library staff at the Royal British Columbia Museum are acknowledged for their efforts in processing my numerous interlibrary loan requests. Ian McTaggart-Cowan kindly reviewed a preliminary draft. The book was greatly improved by three anonymous reviewers who provided many constructive criticisms and pointed out several important references that I had overlooked.

David Nagorsen

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INTRODUCTION

A basic tool for biologists working with any group of organisms is a taxonomic reference that provides the scientific names for species and other taxonomic groups. For anyone interested in the species and subspecies of mammals found in British Columbia, the standard reference has been the handbook *Mammals of British Columbia* by Cowan and Guiguet, last revised in 1965. This text is dated, however, because in the past two decades there has been considerable research on the systematics of North American mammals. Six new species of mammals have been added to the province's mammalian fauna. More important new taxonomic revisions have resulted in major changes in taxonomy and nomenclature making many of the names used by Cowan and Guiguet (1965) obsolete. The results of this recent research constitutes an enormous volume of literature that is scattered in various scientific journals and unpublished sources. Most of this literature is known only to specialists in mammalian systematics. Several taxonomic synopses have been published recently (e.g., Hall 1981; Honacki et al. 1982; Jones et al. 1986). However they are not aimed at the biologist primarily interested in the mammals of British Columbia.

The need to compile these recent findings into an up-to-date reference source on British Columbia mammals resulted in this publication. It is intended for a wide range of users. In addition to museum biologists and other mammalian systematists, the information summarized herein will be useful to government biologists in wildlife or forestry agencies. Wildlife managers require up-to-date information on taxonomy and nomenclature in order to manage the province's mammalian fauna and to name species and subspecies in wildlife regulations and endangered species acts. The publication also may assist students, ecologists, and serious naturalists. On its simplest level, the publication provides a basic reference to the currently accepted common and scientific names of British Columbia mammals. However, it provides more than information on names. For example, a biologist interested in marmots can determine the number of species in the province, their geographic range, the most recent taxonomic revision of each species, the number of subspecies currently recognized for each species, where they occur, and who described them. In addition a list of synonyms is provided for each species and the reader can readily obtain the current scientific name for obsolete species names that often appear in the older literature.

The information herein will also assist taxonomists and systematists to identify taxa that require more research. Although the province's mammalian fauna is well known in comparison to such groups as the invertebrates, there are still a number of interesting taxonomic problems for the mammalian taxonomist. It is hoped that this publication will stimulate modern systematic studies on these problems.

Finally, it should be evident that this publication is a technical reference to taxonomy and nomenclature and it is not intended to be a revision of Cowan and Guiguet's *Mammals of British Columbia*. A comprehensive overview of the distribution, zoogeography and ecology of the province's mammals that includes precise range maps certainly is needed. But it is far beyond the scope of this work and will be the subject of a new series of revised Mammal Handbooks.

Classification

Five hierarchical taxonomic categories are employed here: order, family, genus, species, and subspecies. Order has the highest ranking; subspecies has the lowest. With this system the Hoary Marmot is classified as:

Order: Rodentia (rodents)

Family: Sciuridae (squirrels)

Genus: *Marmota* (marmots and woodchucks)

Species: *caligata* (species name for Hoary Marmot)

subspecies: *raceyi* (one of the 8 races or subspecies recognized)

The generic and species names form the unique binomen of the species. By convention they are written in italics with the generic name capitalized and the specific name in lower case. For example, the scientific name of the Hoary Marmot is written as *Marmota caligata*. The subspecific name designates the geographic race. For example, in the Hoary Marmot eight subspecies are recognized; the name *raceyi* is applied to the race inhabiting the southern Coast Mountains of British Columbia. The full scientific name for a subspecies is a trinomen—*Marmota caligata raceyi*.

Scientific Nomenclature

Species and Higher Taxonomic Categories

There is no standard list of scientific names for North American mammal species comparable to the *Checklist of North American Birds* prepared by the American Ornithologists' Union. Scientific names of orders, families, and genera used herein are all taken from Honacki et al. (1982). I based species names on a combination of Honacki et al. (1982) and Jones et al. (1986). At the species level the taxonomy of several genera of British Columbia mammals (e.g., *Peromyscus*) is still unresolved. Mammalian taxonomy is dynamic and future research will undoubtedly result in changes to some of the species names used herein.

Subspecies

Geographic variation (i.e., regional differentiation among populations of a species) is characteristic of most mammals. A number of factors are involved, but the isolation of populations by geographic or ecological barriers and effects of different environments are major causes. British Columbia, with its complex glacial history and diverse topography and environments, has provided a rich setting for geographic variation. The mountain barriers and their associated life zones have promoted extensive differentiation among populations of mammals particularly the smaller terrestrial species. Moreover the isolated islands that occur off the coast support many unique insular forms. Because of their mobility and exposure to a relatively uniform environment, marine mammals as a rule demonstrate less geographic variation than terrestrial mammals. Nonetheless, it is now evident that local geographic variants exist even in some of the marine mammals, particularly the smaller dolphins and porpoises.

Taxonomists have attempted to classify distinct geographic variants of a species by the use of the subspecies category. A subspecies is defined as an aggregate of populations of a species inhabiting a subdivision of its range and differing taxonomically from other populations of the species. Although the use of the subspecies to designate distinct geographic races of a species has a long history in mammalian taxonomy, its use has become increasingly controversial. Some taxonomists now reject the subspecies concept entirely (Wilson and Brown 1953; Gould and Johnston 1972; Baker 1985). A few of their more serious criticisms are: geographic variation in mammals with broad ranges is generally continuous (i.e., clinal) and partitioning this variation into discrete races is artificial; boundaries separating subspecies generally correspond to areas that are poorly represented by specimens and therefore reflect sampling bias; separate characters (e.g., pelage colour as opposed to cranial morphology) often demonstrate different patterns of geographic variation and subspecies of a species depend on the characters chosen by the researcher; even in mammals with well-defined isolated forms (e.g., island races), it would be simpler to designate these unique forms by a geographic label rather than a formal scientific name.

Despite these serious criticisms the subspecies category is still widely used in mammalian taxonomy and most of the recent taxonomic revisions employ subspecies to designate unique geographic forms. Some taxonomists argue that the subspecies category is still valid for recognizing distinct populations that are separated by geographic barriers or sharply-defined zones of intergradation (Pimentel 1959; Munroe 1982; Zusi 1982). In recent years with the growing emphasis on preserving variation or diversity within species, wildlife biologists and conservationists have become increasingly interested in subspecies. Even with all its shortcomings, the subspecies category is considered by some to be a useful measure of taxonomic diversity within a species. Moreover, it has been used in wildlife management for identifying unique populations that warrant protection or special management. The use of the subspecies category in wildlife biology is

particularly relevant to British Columbia because it supports a greater number of mammalian subspecies than any other Canadian province. More than half of these subspecies are found nowhere else in Canada (Bunnell and Williams 1980).

There is no standard list of subspecies of North American mammals that is universally accepted by mammalogists. The synopsis in *Mammals of North America* by Hall (1981) is an attempt to provide a reference to all North American mammalian species and subspecies. However, some of the subspecies in *Mammals of North America* are not consistent with the recent literature and even some of the species used by Hall (1981) are outdated and inconsistent with Honacki et al. (1982) and Jones et al. (1986). I have based my subspecies on the most recent taxonomic revisions published as of 1989. However, a considerable number of mammalian species have not been revised for many years. For these I used the subspecies names given in Hall (1981). However the reader should be aware that a great number of the subspecies described are questionable. Many were delimited with subjective non-quantitative methods, inadequate sample sizes, and little appreciation for variation within a population. Today taxonomists employ multivariate analyses of morphological characters and other techniques such as chromosomal and biochemical analyses to assess the patterns of geographic variation in species. These modern methods have been applied to relatively few species of British Columbia mammals.

Common Names

Common names for orders and families were taken from Jones et al. (1986). In contrast to birds, there are no standardized common names for North American mammal species. Moreover, mammalogists rarely use vernacular names for the smaller species and their common names are somewhat contrived. Common names used here are mostly from van Zyll de Jong (1983a, 1985) and Jones et al (1986). In his now-outdated *Catalogue of Canadian Recent Mammals*, Anderson (1946) provided common names for all the mammalian subspecies. However, there has been no recent attempt to provide standard common names for mammalian subspecies and except for a few of the big game mammals with widely accepted common names for their races, no common names are provided here for subspecies.

Organization of Taxonomic Summaries

In publications of this type the arrangement of orders and families usually follows a presumed evolutionary sequence for mammals. A number of different arrangements have been proposed. The arrangement of orders used here follows Jones et al. (1986). Families within an order, genera within a family, species of a genus, and subspecies of a species are all arranged alphabetically so that the reader can readily find a particular taxon.

For each genus the number of living (i.e., extant) species found in North America and British Columbia are given and the authors of the most recent taxonomic revisions are listed. The scientific name and authority are given for each species. I followed the convention of enclosing author(s) name(s) and date in parentheses when species were named by their author in a different genera than the one in which they are now placed. In an attempt to standardize common names, I provided what I consider to be the most appropriate common name for each species. For monotypic species (i.e., no subspecies) the original description, type locality, and type specimen (see subspecies for definitions) are cited. To put a species in perspective its overall range as well as its range in the province is described. References for systematic revisions are provided and taxonomic problems are discussed. Synonyms listed for a species include different name combinations, outdated or obsolete names, or alternate names for species whose taxonomy is controversial. This list mainly includes synonyms that apply to British Columbia populations and it is not intended to be a comprehensive review of the synonymy of a species. Alternate English common names that appear in the literature are listed under OTHER COMMON NAMES.

In the subspecies section I list the total number of subspecies recognized for a species and the number that occur in the province. References for taxonomic revisions of subspecies and studies of geographic variation are given. Systematic problems are discussed and I comment on the validity of the currently recognized subspecies. (As I have already pointed out, most species are in need of a modern revision.) Subspecies that occur in the province are then listed and information for each is presented in a standard format under five subheadings:

Original Description. The author's name, date and the publication where the original description of the subspecies was first published are given here.

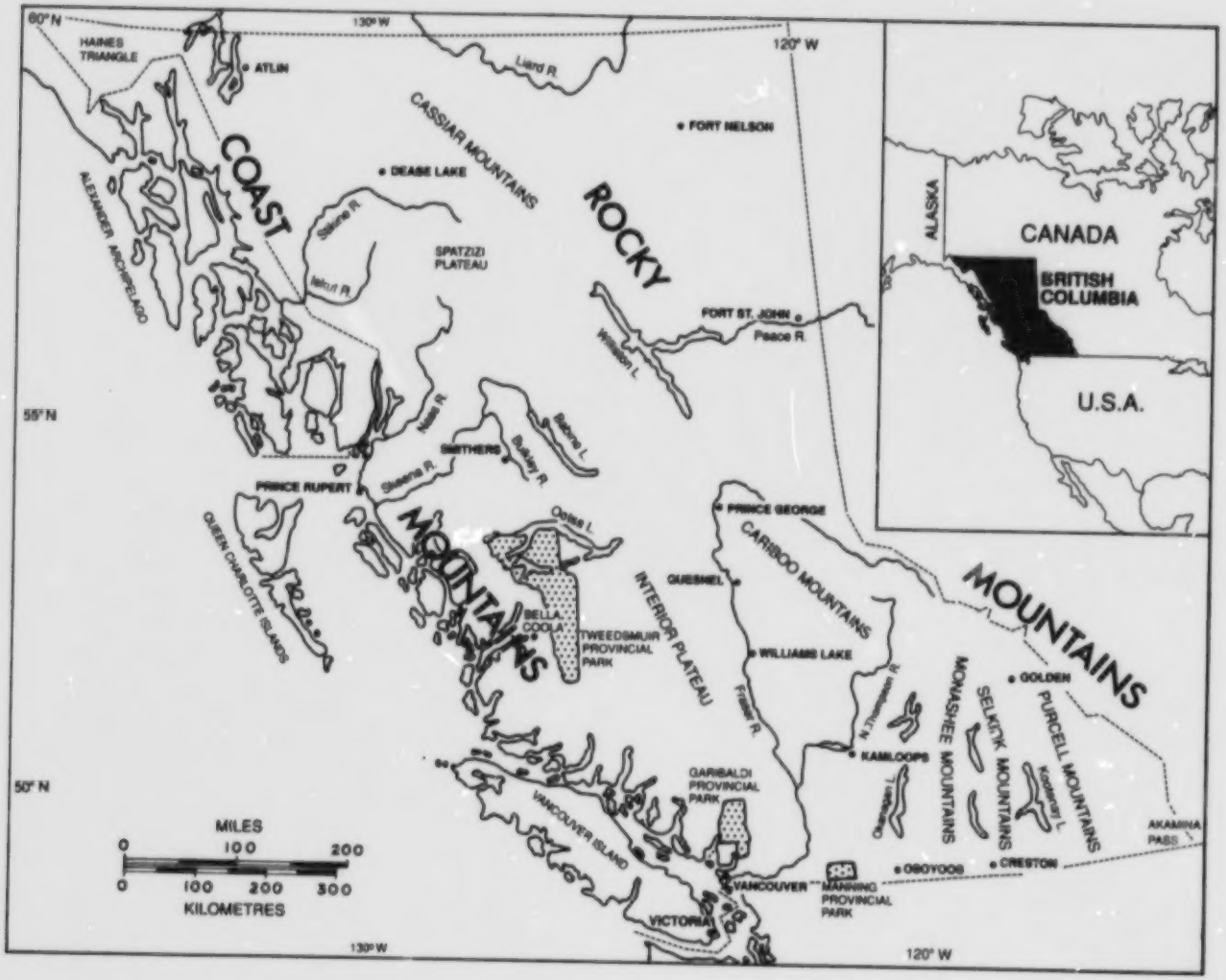
Type Locality. This is the location where the type specimen was collected. Distance and elevation units are those given in the original description; metric conversions are in parentheses.

Type Specimen. Each subspecies name is attached to an individual preserved specimen (the type specimen) that is stored in a museum collection. The specimen selected as the type of the subspecies is designated by the author(s) of the original description. The type specimen serves only as a name-bearer for the taxon, it is not intended to represent a typical individual of that taxon. The museum abbreviation (indicating the museum where the type is stored) and the catalogue number are given under this subheading. Abbreviations for museums are as follows:

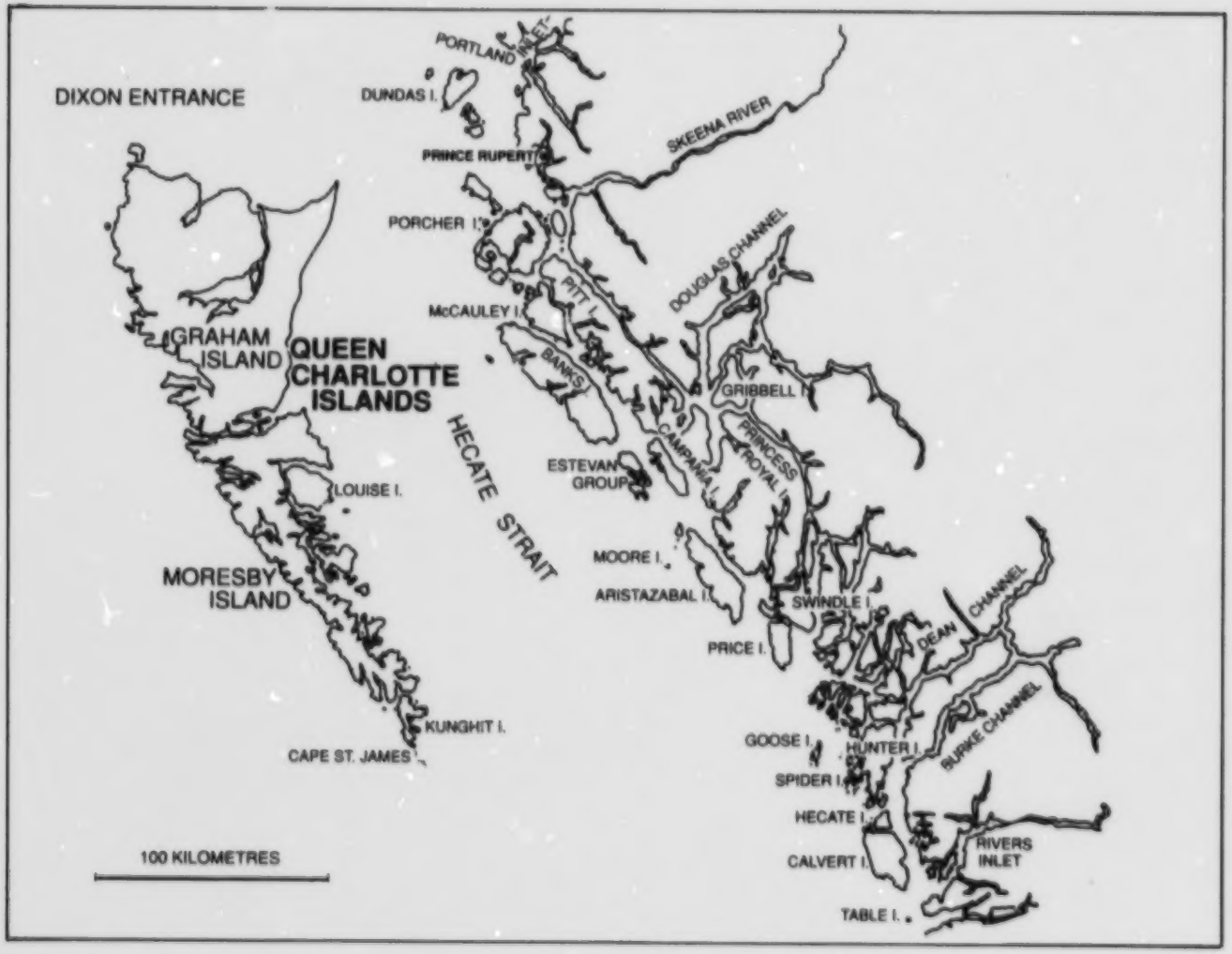
AMNH, American Museum of Natural History, New York
ANSP, Philadelphia Academy of Natural Sciences, Philadelphia
RBCM, Royal British Columbia Museum, Victoria (formerly the British Columbia Provincial Museum)
BMNH, British Museum (Natural History), London
FMNH, Field Museum of Natural History, Chicago
MCZ, Museum of Comparative Zoology, Harvard University, Cambridge
MVZ, Museum of Vertebrate Zoology, University of California, Berkeley
NMC, National Museum of Natural Sciences, Ottawa
UBC, Cowan Vertebrate Museum, University of British Columbia, Vancouver
UMMZ, Museum of Zoology, University of Michigan, Ann Arbor
USNM, National Museum of Natural History, Washington, D.C.

Range. A brief description of the geographic range of the subspecies is given here. I chose not to show subspecies boundaries on species range maps. A number of mammals are represented by a single race in British Columbia and a map for these species would simply represent a species range map. It is beyond the scope of this work to produce precise range maps. For species represented by two or more races in the province, I felt that maps showing the range of subspecies would be misleading. Except for isolated races (e.g., island subspecies), subspecies are connected by zones of intergradation where intermediate forms exist. Therefore, it is difficult to define precise boundaries between subspecies. Comprehensive studies of geographic variation across the province have not been done for most of these mammals; therefore, the boundaries or zones of intergradation separating their races are, at best, speculative.

Remarks. Where appropriate a remarks section is included to discuss taxonomic problems.

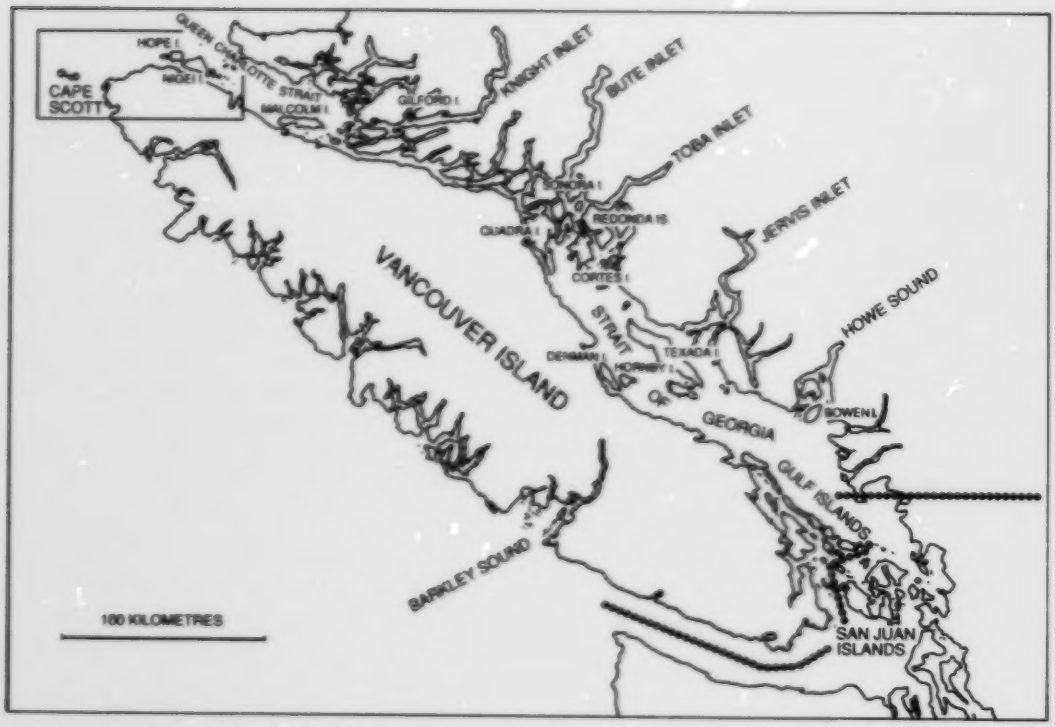


General geographic features of British Columbia.



Islands and inlets of the northern coast of British Columbia.

Islands off the northern coast of Vancouver Island.



Islands and inlets of the southern coast of British Columbia.

TAXONOMIC SUMMARIES

Order Marsupialia — Marsupials

Family Didelphidae — New World Opossums

Genus *Didelphis*

The genus was revised by Gardner (1973); one species occurs in temperate North America.

Didelphis virginiana Kerr, 1792

North American Opossum

This species has a broad range across eastern and central North America and Middle America. Introduced to western North America, there are now populations established in western California, Oregon, Washington, and extreme southwestern British Columbia. According to Carl and Guiguet (1972), *D. virginiana* first appeared in the province in 1949 presumably from populations inhabiting western Washington.

SYNONYMS. *Didelphis marsupialis*.

OTHER COMMON NAMES. American Opossum, Virginia Opossum.

SUBSPECIES. Subspecies were revised by Gardner (1973). Two occur in North America; one is found in British Columbia.

Didelphis virginiana virginiana

Original Description. Linnaeus 1758: Syst. Nat. 10,1:54.
Type Locality. Virginia, United States.
Type Specimen. None designated.
Range. Eastern North America from southern Ontario and New England to the southeastern United States. Populations in western North America were introduced. In British Columbia it is restricted to the lower Fraser Valley where the eastern limit of its range is Spuzzum.

Order Insectivora — Insectivores

Family Soricidae — Shrews

Genus *Sorex*

The first major revision of the genus was that of Jackson (1928). Important recent overviews include Junge and Hoffmann (1981), van Zyll de Jong (1983a), and George (1988). A number of systematic and nomenclatural problems remain to be resolved. About 25 species are currently recognized in North America; 9 occur in British Columbia.

Sorex arcticus Kerr, 1792

Black-backed Shrew

Found throughout the boreal forests of Canada and the Great Lakes states of the United States, *S. arcticus* is restricted to the northeastern corner of British Columbia. Taxonomic relationship with the closely related Tundra Shrew (*Sorex tundrensis*) is discussed in that account.

SYNONYMS. *Sorex richardsonii*.

OTHER COMMON NAMES. Arctic Shrew, Saddle-backed Shrew.

SUBSPECIES. Traditionally, three subspecies have been recognized (Hall 1981); one occurs in the province. Van Zyll de Jong (1983b) and Volobouev and van Zyll de Jong (1988) demonstrated that the eastern race from the Maritimes may be a distinct species. A modern study of geographic variation across the range is needed.

Sorex arcticus arcticus

Original Description. Kerr 1792. Animal Kingdom:203.
Type Locality. Severn Settlement (= Fort Severn), Ontario.
Type Specimen. Not known to exist.
Range. Across northern Canada from the Northwest Territories, and the Yukon Territory to the Maritimes. It is restricted to the northeastern part of the province (Fort Nelson - Peace River area).

Sorex bendirii (Merriam, 1884)

Pacific Water Shrew

S. bendirii occupies the coastal forests of the Pacific Northwest where it ranges from California to southwestern British Columbia.

SYNONYMS. *Atophyrax bendirii*, *Neosorex bendirii*.

OTHER COMMON NAMES. Marsh Shrew, Bendire Shrew.

SUBSPECIES. Three subspecies were recognized by Hall (1981); one occurs in the province. There has been no modern study of geographic variation in this species.

Sorex bendirii bendirii

Original Description. Merriam 1884. Trans. Linn. Soc. New York 2:217.
Type Locality. Near Williamson River, 18 mi. (30 km) SE Fort Klamath, Klamath Co., Oregon.
Type Specimen. USNM 186442.
Range. Northern California, coastal mountains of Oregon, western Washington, and Fraser Delta area of British Columbia.

Sorex cinereus Kerr, 1792

Common Shrew

S. cinereus has the broadest distribution of any North American shrew ranging from Alaska and northern Canada to the central United States. In British Columbia it inhabits the entire mainland and some adjacent coastal islands.

SYNONYMS. *Sorex personatus*.

OTHER COMMON NAMES. Cinereus Shrew, Masked Shrew.

SUBSPECIES. Hall (1981) recognized 14 subspecies in North America but 4 are probably distinct species (Jones *et al*. 1986, van Zyll de Jong 1983a). There are 2 subspecies in the province. A modern study of geographic variation across the entire range is needed.

Sorex cinereus cinereus

Original Description. Kerr 1792: Animal Kingdom:206.
Type Locality. Severn Settlement (= Fort Severn), Ontario.
Type Specimen. Not known to exist.
Range. From Alaska throughout most of Canada and the western United States. It occupies the entire province east of the coastal mountain ranges.

Sorex cinereus streatori

Original Description. Merriam 1895: N. Amer. Fauna 10:62.
Type Locality. Yakutat, Alaska.
Type Specimen. USNM 73537.
Range. The Pacific coast from Washington to Alaska. It occupies all of the coastal mainland of British Columbia as well as Pitt, McCauley, Princess Royal, Smythe, Townsend, Yeo, Campbell, King, Hunter, Spider and Ruth islands.

Sorex hoyi Baird, 1858

Pygmy Shrew

A boreal species, *S. hoyi* is widely distributed throughout Alaska, Canada and the United States. It occupies the northern, central and eastern parts of the province, but is absent in southwestern British Columbia. In most of the literature, authors have followed Jackson (1928) and classified this species in the genus *Microsorex*. But Diersing (1980) and Junge and Hoffmann (1981) considered *Microsorex* to be a subgenus of *Sorex* and classified the Pygmy Shrew as *Sorex hoyi*. Genic data (George 1988) also support the inclusion of the pygmy shrew in the genus *Sorex*.

SYNONYMS. *Microsorex hoyi*.

OTHER COMMON NAMES. None.

SUBSPECIES. Geographic variation and subspecies were reviewed by Diersing (1980) who recognized six subspecies, with one occurring in the province.

Sorex hoyi hoyi

Original Description. Baird 1857: Repts. Expl. Surv. 8(1):32.
Type Locality. Racine, Racine Co., Wisconsin.
Type Specimen. USNM 632/1783.
Range. Broadly distributed across Canada, the Rocky Mountains and the Great Lakes states of the United States. There are few records from British Columbia but it probably occupies the entire mainland except for the southwest.

Sorex monticolus Merriam, 1890

Dusky Shrew

S. monticolus ranges throughout western North America from Mexico to Alaska. In British Columbia it occurs throughout the entire mainland. It also inhabits many coastal islands and is the only species of shrew found on many of these islands. The nomenclature and taxonomy of this species is controversial. Although it was described as *Sorex obscurus* in most of the literature, Hennings and Hoffmann (1977) concluded that the name *monticolus* takes priority over *obscurus* because of its earlier usage and the Dusky Shrew should be classified as *S. monticolus*. In addition to confusion about nomenclature, taxonomists have disagreed on the relationships between *S. monticolus* and the morphologically similar Vagrant Shrew (*Sorex vagrans*). Jackson (1928) considered

S. vagrans and *S. obscurus* (= *monticolus*) to be distinct species although he noted that the two taxa were difficult to distinguish in the Rocky Mountains. In a major revision, Findley (1955) interpreted similarities in size and colour among some populations of *vagrans* and *obscurus* (= *monticolus*) as intergradation and he concluded that the two taxa were part of a ring of overlapping subspecies from a single species *S. vagrans*. Based on dental characters, Hennings and Hoffmann (1977) concluded that *S. vagrans* and *S. monticolus* are distinct species. The two species have a wide area of overlap in the southern mainland of British Columbia and Vancouver Island and in these regions the two taxa may coexist at the same locality.

SYNONYMS. *Sorex dobsoni*, *Sorex longicauda*, *Sorex longicauda elassodon*, *Sorex longicauda prevostensis*, *Sorex monticolus mixtus*, *Sorex obscurus*, *Sorex obscurus calvertensis*, *Sorex obscurus elassodon*, *Sorex obscurus insularis*, *Sorex obscurus isolatus*, *Sorex obscurus longicauda*, *Sorex obscurus prevostensis*, *Sorex obscurus setosus*, *Sorex setosus*, *Sorex vagrans obscurus*, *Sorex vagrans similis*.

OTHER COMMON NAMES. Montane Shrew.

SUBSPECIES. Important taxonomic works on the insular populations of British Columbia include Cowan (1941), Foster (1965), and George and Smith (1989). Hennings and Hoffmann (1977) listed 17 subspecies; 8 are found in the province. But some of these races are questionable and a modern study of geographic variation throughout the range is needed. Specimens from numerous islands off the east and west coasts of Vancouver Island have never been described or formally assigned to a subspecies. They may represent populations of the subspecies *isolatus* or new undescribed subspecies.

Sorex monticolus calvertensis

Original Description. Cowan 1941. Proc. Biol. Soc. Wash. 54:103.
Type Locality. Safety Cove, Calvert Island, British Columbia.
Type Specimen. RBCM 1947.
Range. An insular race restricted to Calvert and Banks Islands, British Columbia.

Sorex monticolus elassodon

Original Description. Osgood 1901: N. Amer. Fauna 21:35.
Type Locality. Cumshewa Inlet, Moresby Island, Queen Charlotte Islands, British Columbia.
Type Specimen. USNM 100597.
Range. An insular race found on the islands of southeastern Alaska and the Queen Charlotte Islands.
Remarks. According to Foster (1965), populations from some of the smaller southeastern islands in the Charlottes are intermediate between *elassodon* and *prevostensis*.

Sorex monticolus insularis

Original Description. Cowan 1941: Proc. Biol. Soc. Wash. 54:103.
Type Locality. Smythe Island of the Bardswell group, British Columbia.
Type Specimen. RBCM 3110.
Range. An insular race restricted to Smythe, Townsend and Reginald islands of the Bardswell group.

Sorex monticolus isolatus

Original Description. Jackson 1922: J. Wash. Acad. Sci. 12:263.
Type Locality. Mouth of Millstone Creek, Nanaimo, Vancouver Island, British Columbia.
Type Specimen. USNM 177719.
Range. An insular race restricted to Vancouver Island.
Remarks. Undescribed specimens from islands off the east and west coasts of Vancouver Island could represent additional populations of this race.

Sorex monticolus longicauda

Original Description. Merriam 1895: N. Amer. Fauna 10:74.
Type Locality. Wrangell, Wrangell Island, Alexander Archipelago, Alaska.
Type Specimen. USNM 74711.
Range. Southeastern coast of Alaska and the coastal mainland region of the province north of Burke Channel. It is found also on Swindle, Princess Royal, Pitt, Campania, Hecate, Dufferin, Chatfield, McCauley, Horsefall, Yeo, Spider, Hunter, Goose and Ruth islands.

Sorex monticolus obscurus

Original Description. Merriam 1891: N. Amer. Fauna 5:34.
Type Locality. Timber Creek, Lemhi Mountain (= Salmon River Mountain), 8,000 ft. (2,440 m), Lemhi Co., Idaho.
Type Specimen. USNM 23525/30943.
Range. From Alaska and western Canada to the southern Rocky Mountains of the United States. It occupies the entire mainland east of the coastal mountain ranges.

Sorex monticolus prevostensis

Original Description. Osgood 1901: N. Amer. Fauna 21:35.
Type Locality. North end of Prevost Island (= Kunghit Island), Queen Charlotte Islands, British Columbia.
Type Specimen. USNM 100618.
Range. An insular race restricted to Kunghit Island.
Remarks. Although most authors (Cowan and Guiguet 1965, Hall 1981, van Zyll de Jong 1983a) consider this race endemic to Prevost Island, Foster (1965) noted that populations from Ramsay and Hippa Islands in the Queen Charlottes and Forrester Island in the Alexander Archipelago of Alaska closely resemble *prevostensis*.

Sorex monticolus setosus

Original Description. Elliot 1899: Field. Columb. Mus. 32, Zool. Ser. 1:274.
Type Locality. Happy Lake, Olympic Mountains, Clallam Co., Washington.
Type Specimen. FMNH 6213.
Range. Western Washington and southwestern British Columbia where it occupies the coastal mainland west of the Coast Mountains divide south from the Burke Channel and some islands including Texada Island.
Remarks. According to George and Smith (1989), this taxon includes the Texada Island form previously classified as *S. m. mixtus*.

Sorex palustris Richardson, 1828

Water Shrew

This boreal shrew is distributed from southern Alaska, through Canada, to the Coastal, Rocky and Appalachian mountains of the United States. It inhabits the entire mainland and Vancouver Island.

SYNONYMS. *Neosorex navigator*.

OTHER COMMON NAMES. American Water Shrew, Navigator Shrew.

SUBSPECIES. Nine subspecies were listed by Hall 1981; two occur in the province. There has been no modern study of geographic variation and the species are in need of a revision.

Sorex palustris brooksi

Original Description. Anderson 1934: Can. Field-Nat. 48:134.
Type Locality. Black Creek, 150 ft. (46 m), Vancouver Island, British Columbia.
Type Specimen. NMC 12370.
Range. An insular race restricted to Vancouver Island.

Sorex palustris navigator

Original Description. Baird 1857. Mamm. N. Amer.:11.
Type Locality. Unknown, probably Idaho.
Type Specimen. USNM 629/1780.
Range. Alaska, the Yukon Territory, the Northwest Territories, British Columbia, and the Coastal and Rocky mountains of the United States. It is found throughout the entire mainland.

Sorex trowbridgii Baird, 1858

Trowbridge's Shrew

A Pacific coast shrew, *S. trowbridgii* ranges from California to extreme southwestern British Columbia.

SYNONYMS. None.

OTHER COMMON NAMES. None

SUBSPECIES. Five subspecies are recognized (Hall 1981); one occurs in British Columbia. There has been no modern study of geographic variation.

Sorex trowbridgii trowbridgii

Original Description. Baird 1857: Mamm. N. Amer.:13.
Type Locality. Astoria, mouth of the Columbia River, Clatsop Co., Oregon.
Type Specimen. USNM 813/3088.
Range. Washington, Oregon and the lower Fraser River Valley in British Columbia.

Sorex tundrensis Merriam, 1900

Tundra Shrew

This shrew occurs in Eurasia and North America where it inhabits Alaska, the northern Yukon, the Northwest Territories and extreme northwestern British Columbia. Taxonomic relationships with the closely related Black-backed Shrew (*S. arcticus*) have been controversial. Merriam (1900) described the Tundra Shrew as a distinct species *Sorex tundrensis* and Jackson (1928) maintained specific status for this taxon. However, Bee and Hall (1956) and Banfield (1974) classified it as a race of *S. arcticus*. Recent morphological studies (Youngman 1975; Junge and Hoffmann 1981; van Zyll de Jong 1983a, 1983b; Junge *et al.* 1983) and genetic studies (George 1988) demonstrate that the Tundra Shrew is a distinct species.

SYNONYMS. *Sorex arcticus tundrensis*.

OTHER COMMON NAMES. None.

SUBSPECIES. According to Junge *et al.* (1983), there are eight subspecies: one is found in North America, the others in Eurasia.

Sorex tundrensis tundrensis

Original Description. Merriam 1900: Proc. Wash. Acad. Sci. 2:16.
Type Locality. St. Michael, Norton Sound, Alaska.
Type Specimen. USNM 99286.
Range. Alaska, the Yukon Territory, the northwestern Northwest Territories and extreme northwestern British Columbia in the Haines Triangle where it is known from only five specimens taken in 1978 and 1979 (Nagorsen and Jones 1981).

Sorex vagrans Baird, 1858

Vagrant Shrew

A western shrew, *S. vagrans* ranges from the southern Rocky Mountains and Pacific coast of California to southern British Columbia where it inhibits the southern mainland, Vancouver Island and the Gulf Islands. See *Sorex monticolus* for a discussion of the taxonomic relationships between *S. monticolus* and *S. vagrans*.

SYNONYMS. *Sorex vancouverensis*, *Sorex vagrans vancouverensis*.

OTHER COMMON NAMES. Wandering Shrew.

SUBSPECIES. Hennings and Hoffmann (1977) recognized four subspecies; one occurs in British Columbia. There has been no modern study of geographic variation throughout the range.

Sorex vagrans vagrans

Original Description. Baird 1857. Mamm. N. Amer. 8:15.
Type Locality. Shoalwater Bay (= Willapa Bay), Pacific Co., Washington.
Type Specimen. USNM 1675.
Range. British Columbia, Washington, Oregon, Idaho, Montana, Wyoming, Utah, California and New Mexico. It occupies the southern mainland from the Pacific coast as far east as Glacier and Revelstoke National Parks and various islands on the southern coast including Vancouver Island, Bowen Island and the Gulf Islands.
Remarks. George and Smith (1989) found the race *S. v. vancouverensis* indistinguishable from this taxon.

Family Talpidae — Moles

Genus *Neurotrichus*

There is one species in the genus. The genus was first revised by Jackson (1915); Yates (1978) assessed geographic variation and revised subspecies using modern techniques.

Neurotrichus gibbsii (Baird, 1858)

Shrew-Mole

Restricted to the Pacific coast west of the coastal mountain areas, this mole ranges from California to British Columbia.

SYNONYMS. *Urotrichus gibbsii*.

OTHER COMMON NAMES. American Shrew-mole.

SUBSPECIES. Yates (1978) recognized five subspecies; one occurs in the province.

Neurotrichus gibbsii gibbsii

Original Description. Baird 1857: Mamm. N. Amer.:76.
Type Locality. White River Pass, N of Mount Rainier, Pierce Co., Washington.
Type Specimen. USNM 662/1843.
Range. Northern California, central Washington east of the Cascade Mountains, Oregon and extreme southwestern British Columbia from the Fraser Delta to Allison Pass in Manning Provincial Park.
Remarks. Although Hall (1981) and Cowan and Guiguet (1965) recognized a second subspecies *N. gibbsii minor* in the lower mainland of the province, Yates (1978) assigned all British Columbia populations to *N. gibbsii gibbsii*.

Genus *Scapanus*

There are three species in the genus; all are restricted to western North America. Two species are found in British Columbia. The genus was revised by Jackson (1915), and by Yates (1978) who investigated relationships among species using morphometric, chromosomal and biochemical data.

Scapanus orarius True, 1896

Coast Mole

This mole occupies the Pacific coast from California to southwestern British Columbia, and eastern Washington and Oregon.

SYNONYMS. None.

OTHER COMMON NAMES. Pacific Coast Mole.

SUBSPECIES. Yates (1978) recognized two subspecies; one occurs in the province.

Scapanus orarius schefferi

Original Description. Jackson 1915, N. Amer. Fauna 38:63.
Type Locality. Walla Walla, Walla Walla Co., Washington.
Type Specimen. USNM 204997.
Range. Northwestern Washington, central Washington east of the Cascades, extreme northwestern Oregon, Idaho and British Columbia where it is confined to the extreme southwestern mainland.
Remarks. Cowan and Guiguet (1965) and Hall (1981) classified the British Columbia populations as *S. orarius orarius*, but Yates (1978) considered all British Columbia populations to be *S. orarius schefferi*.

Scapanus townsendii (Bachman, 1839)

Townsend's Mole

Found throughout the coastal areas of California, Oregon and Washington, this mole occurs only in the vicinity of Huntingdon in extreme southwestern British Columbia.

SYNONYMS. *Scalops townsendii*.

OTHER COMMON NAMES. None.

SUBSPECIES. Yates (1978) recognized two subspecies; one occurs in the province.

Scapanus townsendii townsendii

Original Description. Bachman 1839. J. Acad. Nat. Sci., Phil 8:58.
Type Locality. Vicinity of Fort Vancouver, Clarke Co., Washington.
Type Specimen. Not known to exist (see Koopman 1976).
Range. It occupies all of the known range of the species except for the Olympic Mountains in northwestern Washington. Recent records suggest that a localized population exists in the Abbotsford-Huntingdon area of the lower Fraser Valley.
Remarks. Before the revision of Yates (1978), the species was considered monotypic with no subspecies.

Order Chiroptera — Bats

Family Molossidae — Molossid Bats

Genus *Nyctinomops*

This taxon was formerly recognized as a subgenus of the genus *Tadarida* (see Hall 1981). However, in a multivariate analysis of the family, Freeman (1981) concluded that the four species of the subgenus *Nyctinomops* were sufficiently distinct from other species of *Tadarida* to warrant treatment as a full genus. Honacki *et al.* (1982) recognized *Nyctinomops* as a genus. There are four species in North America; one has been recorded in the province.

Nyctinomops macrotis (Gray, 1839)

Big Free-tailed Bat

Gray, 1839. Ann. Nat. Hist. 4:5. Type Locality, Cuba. Type Specimen, probably in BMNH.

An inhabitant of the southwestern United States and Mexico, the occurrence of this bat in the province is based on a single specimen collected at New Westminster in 1938. This locality is so far north of the known range that it probably represents an accidental occurrence.

SYNONYMS. *Nyctinomus macrotis*, *Tadarida macrotis*, *Tadarida molossa*.

OTHER COMMON NAMES. None.

SUBSPECIES. No subspecies are recognized; however, the species is in need of a systematic revision according to Honacki *et al.* (1982).

Family Vespertilionidae — Vespertilionid Bats

Genus *Antrozous*

There is one species in North America. Martin and Schmidly (1982) revised the genus.

Antrozous pallidus (Le Conte, 1856)

Pallid Bat

This bat is widely distributed across western North America, Mexico and Cuba. In Canada, where it is at the northern periphery of its range, it is restricted to the Okanagan Valley of British Columbia.

SYNONYMS. *Vespertilio pallidus*.

OTHER COMMON NAMES. None.

SUBSPECIES. Six subspecies were recognized by Martin and Schmidly (1982); one occurs in the province.

Antrozous pallidus pallidus

Original Description. Le Conte 1856: Proc. Acad. Sci. Phil. 7:437.
Type Locality. El Paso, El Paso Co., Texas.
Type Specimen. USNM 152/5467.
Range. Mexico, southwestern United States, north to eastern Washington and Oregon, and the southern Okanagan Valley of British Columbia (van Zyll de Jong 1985).

Genus *Eptesicus*

About 33 species are recognized; 3 occur in North America.

Eptesicus fuscus (Palisot de Beauvois, 1796)

Big Brown Bat

E. fuscus has a vast range throughout North and Middle America, and northern South America. It inhabits Vancouver Island and the southern mainland.

SYNONYMS. *Eptesicus pallidus*, *Vespertilio fuscus*.

OTHER COMMON NAMES. None.

SUBSPECIES. Western subspecies of *E. fuscus* were revised by Engels (1936); Hall (1981) reported five subspecies for continental North America. Based on a detailed multivariate study of geographic variation among North America populations, Burnett (1983) modified the boundaries of continental subspecies. Although Cowan and Guiguet (1965) and Hall (1981) reported two subspecies (*E. f. bernardinus* and *E. f. pallidus*) in the province, Burnett (1983) assigned all British Columbia populations to *E. f. bernardinus*.

Eptesicus fuscus bernardinus

Original Description. Rhoads 1902: Proc. Acad. Nat. Sci. Phil. 53:619.
Type Locality. Near San Bernardino, Bernardino Co., California.
Type Specimen. ANSP 8527.
Range. California, Washington, Oregon and British Columbia where it is known from Vancouver Island and the south-central mainland as far north as Stuie, Williams Lake and the Peace River area.

Genus *Euderma*

The genus was revised by Handley (1959); he recognized one species.

Euderma maculatum (J.A. Allen, 1891)

Spotted Bat

Allen, 1891. Bull. Amer. Mus. Nat. Hist. 3:195. Type Locality, near Piru, Ventura Co., California. Type Specimen, AMNH 3920/2991.

This bat inhabits Mexico, the western United States and south-central British Columbia. At the northern periphery of its range, it is restricted to the Okanagan Valley (van Zyll de Jong 1985) in British Columbia where it was first discovered in 1979 (Woodsworth *et al.* 1981).

SYNONYMS. *Euderma maculata*, *Histiotus maculatus*.

OTHER COMMON NAMES. Pinto Bat.

SUBSPECIES. No subspecies are recognized (Handley 1959).

Genus *Lasionycteris*

There is one species in the genus.

Lasionycteris noctivagans (Le Conte, 1831)

Silver-haired Bat

Le Conte, 1831. Animal Kingdom vol. 1, p. 31. Type Locality, eastern United States. Type Specimen, not known to exist.

L. noctivagans ranges from southeastern Alaska, and southern Canada across the entire United States. It is known from the northwestern, central, and southern mainland and various islands including: Vancouver Island, the Queen Charlotte Islands, and King, Texada, Calvert, Princess Royal and Goose islands.

SYNONYMS. *Vespertilio noctivagans*.

OTHER COMMON NAMES. None.

SUBSPECIES. No subspecies are recognized (Hall 1981).

Genus *Lasiurus*

The genus was revised by Miller (1897), Hall and Jones (1961), and Baker *et al.* (1988). Although Hall (1981) concluded that the name *Nycteris* takes priority over *Lasiurus*, Honacki *et al.* (1982) and Jones *et al.* (1986) recommended that the name *Lasiurus* be applied to this genus. There are five species in North America; two are found in British Columbia.

Lasiurus blossevilli (Lesson and Garnot, 1826)

Southern Red Bat

This bat has an enormous range from western North America southward to Middle and South America. In this province, however, it is known from only two localities. All North American populations of the red bat have been assigned to a single species *L. borealis*. However, Baker *et al.* (1988) demonstrated that the western populations are sufficiently distinct to warrant recognition as a full species *L. blossevilli*.

SYNONYMS. *Atalapha teliotis*, *Lasiurus borealis teliotis*, *Nycteris borealis*, *Vespertilio borealis*, *Vespertilio blossevilli*.

OTHER COMMON NAMES. None.

SUBSPECIES. Two subspecies are recognized in North America; one is found in the province.

Lasiurus blossevilli teliotis

Original Description. Allen 1891. Proc. Amer. Phil. Soc. 29:5.
Type Locality. Unknown, probably in California.
Type Specimen. USNM 84555.
Range. Northern Mexico, western United States and British Columbia where there are records only from the Skagit Valley (Cowan and Guiguet 1965) and the Okanagan Valley (Fenton *et al.* 1983).

Lasiurus cinereus (Palisot de Beauvois, 1796)

Hoary Bat

L. cinereus has an immense range from North America to South America.

SYNONYMS. *Vespertilio cinereus*, *Nycteris cinerea*.

OTHER COMMON NAMES. None.

SUBSPECIES. One subspecies is recognized from North America.

Lasiurus cinereus cinereus

Original Description. Beauvois 1796: Cat. Raisonne Mus. Peale Phil.:18.
Type Locality. Philadelphia, Pennsylvania.
Type Specimen. None designated.
Range. It is distributed throughout all of the continental United States and most of southern and central Canada. It inhabits Vancouver Island and the southern mainland area.

Genus *Myotis*

A major revision of North American species was by Miller and Allen (1928). Findley (1972) investigated phenetic relationships among species of the genus including North American species using multivariate statistics. A number of systematic and nomenclatural problems remain to be resolved with North American species. About 13 species occur in North America; 9 inhabit the province.

Myotis californicus (Audubon and Bachman, 1842)

California Myotis

A western bat, *M. californicus* ranges from southern Alaska, across British Columbia and the western United States to Mexico. It is found in the western and southern parts of the province and some of the coastal islands including Vancouver Island and the Queen Charlotte Islands.

SYNONYMS. *Vespertilio californicus*.

OTHER COMMON NAMES. California Bat.

SUBSPECIES. Bogan (1975a), who studied geographic variation among populations in the southwestern United States and Mexico with multivariate methods, concluded that the patterns of morphometric variation support the three subspecies recognized in this region. Nonetheless there has been no comprehensive study of geographic variation throughout the entire range. Relationships with *Myotis leibii* were investigated by van Zyll de Jong (1984, 1985). There are four subspecies (Hall 1981); two occur in the province.

Myotis californicus californicus

Original Description. Audubon and Bachman 1842: J. Acad. Nat. Sci. Phil. 8:285.
Type Locality. California.
Type Specimen. None designated.
Range. California, Oregon, Utah, Idaho, Washington and the southern interior of the province from the Okanagan Valley to Revelstoke.

Myotis californicus caurinus

Original Description. Miller 1897: N. Amer. Fauna 13:72.
Type Locality. Massett, Graham Island, Queen Charlotte Islands, British Columbia.
Type Specimen. USNM 72219.
Range. A coastal race that is distributed from California to the Alexander Archipelago of Alaska. It is known from coastal areas in the southern and central mainland as far north as Prince Rupert, and from various islands including the Queen Charlotte Islands and Vancouver Island.

Myotis ciliolabrum (Merriam, 1886)

Western Small-footed Myotis

M. ciliolabrum ranges from northern Mexico through the western United States to southern Alberta and southern British Columbia. Until recently western and eastern forms of the Small-footed Myotis were considered a single species *Myotis leibii*, but morphological and biochemical data (van Zyll de Jong 1984, 1985; Herd 1987) indicate that the western populations are a separate species *M. ciliolabrum*.

SYNONYMS. *Myotis leibii ciliolabrum*, *Myotis subulatus*, *Vespertilio ciliolabrum*.

OTHER COMMON NAMES. Western Small-footed Bat.

SUBSPECIES. Two subspecies are recognized (van Zyll de Jong 1984, 1985); one occurs in the province.

Myotis ciliolabrum melanorhinus

Original Description. Merriam 1890. N. Amer. Fauna 3:46.
Type Locality. Little Spring, 8,250 ft. (2,516 m), San Francisco Mountains, Coconino Co., Arizona.
Type Specimen. USNM 18684.
Range. From northern Mexico through the western United States to British Columbia where it is restricted to the Okanagan and Similkameen valleys.

Myotis evotis (H. Allen, 1864)

Western Long-eared Myotis

Distributed throughout western Canada and the western United States, *M. evotis* occupies the central and southern part of the province and Vancouver Island. The long-eared *Myotis* of the *evotis* group (Findley 1972) has been a problem for taxonomists. Systematic relationships among the three Canadian taxa (*Myotis evotis*, *Myotis keenii*, and *Myotis septentrionalis*) were investigated by van Zyll de Jong (1979), who concluded that *M. evotis* is a distinct species with no evidence of hybridization with *M. keenii*.

SYNONYMS. *Vespertilio evotis*.

OTHER COMMON NAMES. Long-eared Bat, Long-eared Myotis.

SUBSPECIES. There are two subspecies (Hall 1981); both are found in the province. However, there has been no modern study of geographic variation.

Myotis evotis evotis

Original Description. Allen 1864. Smith. Mis. Coll. 7(165):8.
Type Locality. Easton, Kittitas Co., Washington.
Type Specimen. USNM 5391/38660 (see Poole and Schantz 1942).
Range. Baja Mexico, the western United States and western Canada. It ranges from south-eastern British Columbia to the Central Interior as far north as Prince George.

Myotis evotis pacificus

Original Description. Dalquest 1943: Proc. Biol. Soc. Wash. 56:1.
Type Locality. 3.5 mi. (5.6 km) E and 5 mi. (8 km) N of Yacolt, 500 ft. (153 m), Clark Co., Washington.
Type Specimen. MVZ 94173.
Range. Western California and Oregon, Washington, Idaho and British Columbia where it inhabits Vancouver Island and the coastal and southern interior as far north as Smithers.

Myotis keenii (Merriam, 1895)

Keen's Long-eared Myotis

Merriam, 1895. Am. Nat. 29:860. Type Locality, Masset, Graham Island, Queen Charlotte Islands, British Columbia. Type Specimen, USNM 729220.

M. keenii is restricted to the west coast of North America where it ranges from Washington to southwestern Alaska. In British Columbia there are records from the coastal mainland, Queen Charlotte Islands and Vancouver Island.

Traditionally the species *M. keenii* was considered to include two groups of geographically separated populations: a west coast group and a group from east-central North America. The two groups were treated as subspecies of a single species with the coastal form classified as *Myotis keenii keenii* and the other form classified as *Myotis keenii septentrionalis* (Miller and Allan 1928; Hall 1981). In a multivariate study, van Zyll de Jong (1979) concluded that *keenii* and *septentrionalis* were separate species distinguished by cranial and pelage characters. The two taxa were formally recognized as distinct species by van Zyll de Jong (1985) and Jones *et al.* (1986).

SYNONYMS. *Myotis keenii keenii*, *Myotis subulatus*, *Vespertilio subulatus*.

OTHER COMMON NAMES. Keen Bat, Keen's Long-eared Bat, Keen's Myotis.

SUBSPECIES. None are recognized (van Zyll de Jong 1985); however, there has been no assessment of geographic variation throughout its range.

Myotis lucifugus (Le Conte, 1831)

Little Brown Myotis

M. lucifugus has the broadest distribution of any North American *Myotis* ranging from Alaska, Canada, and most of the United States to northern Mexico. It inhabits the entire mainland, the Queen Charlotte Islands and Vancouver Island. Systematic relationships between *M. lucifugus* and the phenetically similar Yuma Myotis (*Myotis yumanensis*) are discussed under the account for *M. yumanensis*.

SYNONYMS. *Vespertilio lucifugus*.

OTHER COMMON NAMES. Little Brown Bat.

SUBSPECIES. There has been no recent study of geographic variation. Hall (1981) recognized six subspecies; three occur in the province.

Myotis lucifugus alascensis

Original Description. Miller 1897. N. Amer. Fauna 13:63.
Type Locality. Sitka, Baranof Island, Alexander Archipelago, Alaska.
Type Specimen. USNM 77416.
Range. Across the west coast of the United States, most of British Columbia, extreme western Alberta and southeastern Alaska. It is known from the central and southern mainland (except the Okanagan) and the Queen Charlotte Islands, Vancouver Island, the Gulf Islands and East Bunsby Island.

Myotis lucifugus carissima

Original Description. Thomas 1904: Ann. Mag. Nat. Hist. Series 7, 13:383.
Type Locality. Lake Hotel, Yellowstone Park, Wyoming.
Type Specimen. BMNH 4.4.25.1.
Range. Widely distributed throughout the western United States. In Canada it is restricted to southern Alberta (Smith and Schowalter 1979) and the southern dry interior of the province from the Okanagan Valley to Kamloops.

Myotis lucifugus lucifugus

Original Description. Le Conte 1831: Animal Kingdom vol. 1:431.
Type Locality. Near Riceboro, Liberty Co., Georgia.
Type Specimen. None designated.
Range. This race occurs throughout all of eastern North America, central and northwestern Canada, and Alaska. According to Cowan and Guiguet (1965), it extends into the northeastern and extreme northern part of the province.

Myotis septentrionalis (Trouessart, 1897)

Northern Long-eared Myotis

Trouessart, 1897. Catal. Mamm. viv. foss., p. 131. Type Locality, Halifax, Nova Scotia. Type Specimen, USNM 8188.

Broadly distributed across eastern North America and central Canada, *M. septentrionalis* is at the western periphery of its range in British Columbia. Here it is known from only a few localities (Hudson Hope, and Mount Revelstoke, Glacier and Kootenay national parks). Taxonomic relationships with *M. keenii* are discussed in that account.

SYNONYMS. *Myotis keenii septentrionalis*. *Myotis subulatus*.

OTHER COMMON NAMES. Northern Long-eared Bat, Northern Myotis.

SUBSPECIES. According to van Zyll de Jong (1985), no subspecies are recognized, but there has been no study of geographic variation across its range.

Myotis thysanodes Miller, 1897

Fringed Myotis

A western bat, it ranges from British Columbia, through the western United States, to Mexico.

SYNONYMS. None.

OTHER COMMON NAMES. Fringed Bat.

SUBSPECIES. There has been no recent revision of this species. Hall (1981) listed three subspecies; one occurs in the province.

Myotis thysanodes thysanodes

Original Description. Miller 1897: N. Amer. Fauna 13:80.
Type Locality. Old Fort Tejon, Techachapi Mountains, Kern Co., California.
Type Specimen. USNM 29827.
Range. A broad distribution from Mexico through the western United States to the Okanagan Valley of British Columbia where it has been recorded as far north as Vernon (van Zyll de Jong 1985).

Myotis volans (H. Allen, 1866)

Long-legged Myotis

M. volans is broadly distributed across northern Mexico, the western United States, Alberta, British Columbia and the coastal islands of southeastern Alaska.

SYNONYMS. *Vespertilio volans*.

OTHER COMMON NAMES. Hairy-winged Myotis, Long-legged Bat.

SUBSPECIES. A multivariate analysis of geographic variation was done by Bogan (1975b) but he did not revise subspecies. There are four subspecies according to Hall (1981); one is found in the province.

Myotis volans longricus

Original Description. True 1886. Science 8:588.
Type Locality. Vicinity of Puget Sound, Washington.
Type Specimen. USNM 15263/22480.
Range. The Pacific coast of the United States, British Columbia, Alberta and the coastal islands of southeastern Alaska. It occupies Vancouver Island and most of the mainland except for the northeast.

Myotis yumanensis (H. Allen, 1864)

Yuma Myotis

M. yumanensis is distributed from British Columbia, through the western United States, to northern Mexico. Ranges of the morphologically similar *M. lucifugus* and *M. yumanensis* overlap broadly in western North America. Generally the two species can be distinguished by external and cranial characters but in some regions (e.g., the southwestern United States) there are individuals that appear morphologically intermediate. These "intermediates" have been interpreted as hybrids and as evidence of interbreeding between the two species (see Parkinson 1979 for review). In a comprehensive study of morphological and genetic characters, Herd and Fenton (1983) found no evidence for interbreeding between the two species in the Okanagan Valley of British Columbia. Although statistical analysis of cranial and external characters revealed some intermediates, these individuals could be positively identified as either *M. lucifugus* or *M. yumanensis* by biochemical analysis of their proteins.

SYNONYMS. *Vespertilio yumanensis*.

OTHER COMMON NAMES. Yuma Bat.

SUBSPECIES. There has been no recent revision of this species. Hall (1981) recognized six subspecies; two occur in the province.

Myotis yumanensis saturatus

Original Description. Miller 1897: N. Amer. Fauna 13:68.
Type Locality. Hamilton, Skagit Co., Washington.
Type Specimen. USNM 17399/24305.
Range. A coastal race ranging from California to British Columbia where it is known from the coastal mainland as far north as the Skeena River and on these islands: Vancouver, Bowen, Princess Royal, King and Goose.

Myotis yumanensis sociabilis

Original Description. Grinnell 1914. Univ. Calif. Publ. Zool. 12:318.
Type Locality. Old Fort Tejon, 3,200 ft. (976 m), Tehachapi Mountains, Kern Co., California.
Type Specimen. MVZ 5158.
Range. California, Oregon, Washington, Idaho, Montana and the southern interior of British Columbia, north to Kamloops and east to Creston.

Genus *Plecotus*

Five species are recognized in the genus; three occur in North America (Honacki *et al.* 1982). One species occurs in the province. North American species were classified in the genus *Corynorhinus* by early workers, but Handley (1959) treated *Corynorhinus* as a subgenus of *Plecotus*.

Plecotus townsendii Cooper, 1837

Townsend's Big-eared Bat

P. townsendii inhabits Mexico, the western United States and British Columbia. A few isolated populations exist in the eastern United States.

SYNONYMS. *Corynorhinus macrotis townsendii*, *Corynorhinus townsendii*.

OTHER COMMON NAMES. Lump-nosed Bat, Western Big-eared Bat.

SUBSPECIES. In his revision, Handley (1959) recognized five subspecies; two occur in the province.

Plecotus townsendii pallescens

Original Description. Miller 1897: N. Amer. Fauna 13:52.
Type Locality. Keam Canyon, Navajo Co., Arizona.
Type Specimen. USNM 66534.
Range. From northern Mexico, through the western United States, to the southern interior of the province as far north as Williams Lake.

Plecotus townsendii townsendii

Original Description. Cooper 1837: Ann. Lyc. Nat. Hist. New York 4:73.
Type Locality. Columbia River, Oregon.
Type Specimen. None designated.
Range. A coastal race that ranges from California to southern British Columbia where it is known from the lower mainland, Vancouver Island and some of the Gulf Islands.

Order Lagomorpha — Lagomorphs

Family Leporidae — Hares and Rabbits

Genus *Lepus*

The first major revision of North American species was that of Nelson (1909). Recent overviews include Chapman *et al.* (1983), Dixon *et al.* (1983) and Flux (1983). Seven species occur in North America; two inhabit British Columbia.

Lepus americanus Erxleben, 1777

Snowshoe Hare

L. americanus is found throughout the boreal regions of North America. It inhabits the entire mainland but is absent from coastal islands.

SYNONYMS. *Lepus bairdii*, *Lepus bairdii cascadensis*, *Lepus saliens*, *Lepus washingtonii*.

OTHER COMMON NAMES. Snowshoe Rabbit, Varying Hare, Varying Rabbit.

SUBSPECIES. Fifteen subspecies are recognized (Hall 1981); seven are found in the province. However, because patterns of cranial variation among populations across the range are largely clinal (Nagorsen 1985), the use of subspecies may be inappropriate for this species.

Lepus americanus bairdii

Original Description. Hayden 1869: Amer. Nat. 3:115.
Type Locality. Near Freemont Peak, Wind River Mountains, Freemont Co., Wyoming.
Type Specimen. None designated but three syntypes exist (Poole and Schanz 1942).
Range. The Rocky Mountains of the United States from Montana to northern New Mexico, extreme southwestern Alberta and the southern Kootenays in extreme southeastern British Columbia.

Lepus americanus cascadensis

Original Description. Nelson 1907: Proc. Biol. Soc. Wash. 20:87.
Type Locality. Roab's Ranch, near Hope, British Columbia.
Type Specimen. MCZ B1886.
Range. A coastal race that is found in the coastal mountain ranges of Washington and British Columbia as far north as Jervis Inlet.

Lepus americanus columbiensis

Original Description. Rhoads 1895: Proc. Acad. Nat. Sci. Phil. 47:242.
Type Locality. Vernon, British Columbia.
Type Specimen. ANSP 7462.
Range. The Rocky Mountains of Alberta, north-central Washington and southern British Columbia where it occurs in the Okanagan Highlands and the Monashee, Selkirk, Purcell, and Rocky mountains.

Lepus americanus dalli

Original Description. Merriam 1900: Proc. Wash. Acad. Sci. 2:29.
Type Locality. Nulato, Alaska.
Type Specimen. USNM 8996/7579.
Range. Alaska, the Yukon Territory, the Northwest Territories and northern British Columbia.
Remarks. Although Dalquest (1942) and Cowan and Guiguet (1965) classified populations in northern British Columbia, the Yukon and the Northwest Territories as *macfarlani*, Youngman (1975) and Hall (1981) considered *macfarlani* inseparable from *dalli*.

Lepus americanus pallidus

Original Description. Cowan 1938: J. Mamm. 19:242.
Type Locality. Chezacut Lake, Chilcotin River, British Columbia.
Type Specimen. RBCM 4717.
Range. Restricted to the province where it inhabits the Interior Plateau and the coastal region from Jervis Inlet to Prince Rupert.

Lepus americanus pineus

Original Description. Dalquest 1942: J. Mamm. 23:178.
Type Locality. Cedar Mountain (= Moscow Mountain), Latah Co., Idaho.
Type Specimen. UMMZ 53867.
Range. Northeastern Washington, northwestern Idaho and the southern Kootenays in the vicinity of Creston and Trail.

Lepus americanus washingtonii

Original Description. Baird 1855: Proc. Acad. Nat. Sci. Phil. 7:333.
Type Locality. Steilacoom, Pierce Co., Washington.
Type Specimen. USNM 280/1223.
Range. A coastal subspecies that occurs west of the Cascade Mountains in Washington and Oregon. It is restricted to the lower Fraser Valley in British Columbia.

Lepus townsendii Bachman, 1839

White-tailed Jackrabbit

L. townsendii is a species of the Great Plains and dry intermontane regions of western Canada and the United States. In British Columbia, where it is at the northern periphery of its range, it may be extirpated.

SYNONYMS. *Lepus campestris*.

OTHER COMMON NAMES. None.

SUBSPECIES. Two subspecies are recognized; one occurs in the province.

Lepus townsendii townsendii

Original Description. Bachman 1839: J. Acad. Nat. Sci. Phil. 8:90.
Type Locality. Fort Walla Walla (= Walla Walla), Walla Walla Co., Washington.
Type Specimen. ANSP 378.
Range. Eastern slopes of the Cascade and Sierra Nevada Mountains, Great Plains, and western slopes of the Rocky Mountains in the United States. Before extirpation this race was restricted in Canada to the southern Okanagan Valley of British Columbia.

Genus *Oryctolagus*

Although *Oryctolagus* is currently accepted as a valid genus, Corbet (1983) noted that *Oryctolagus* is remarkably similar to the New World cottontail genus *Sylvilagus*. There is one species.

Oryctolagus cuniculus (Linnaeus, 1758)

European Rabbit

Linnaeus, 1758. Syst. Nat. 10 1:58. Type Locality, Germany. Type Specimen, none designated.

The original range of this rabbit was probably the Iberian Peninsula of Spain. In historical times, feral populations were established on all the continents and many oceanic islands through introductions. The species was domesticated 600-1000 A.D. and many different breeds are now established. In British Columbia there have been many introductions either from deliberate releases or escapes; but, most failed to establish feral populations. Feral populations exist on Sidney, James and Triangle islands; small localized populations may exist also on Vancouver Island and the mainland.

SYNONYMS. *Lepus cuniculus*.

OTHER COMMON NAMES. Domestic Rabbit (numerous common names exist for different breeds).

SUBSPECIES. Because of the complex mix of feral, introduced and domesticated forms, the use of subspecies is inappropriate.

Genus *Sylvilagus*

The genus was first revised by Nelson (1909). Systematic relationships among North American and Middle American species were investigated by Diersing (1978) employing multivariate analyses of morphological data. There are eight species in North America; two are found in British Columbia.

Sylvilagus floridanus (J.A. Allen, 1890)

Eastern Cottontail

Widely distributed throughout eastern and central North America, Middle America, and northern South America, *S. floridanus* was introduced to the Pacific Northwest of the United States and southwestern British Columbia.

SYNONYMS. *Lepus sylvaticus*.

OTHER COMMON NAMES. None.

SUBSPECIES. Hall (1981) listed 14 subspecies in North America, but Diersing (1978) synonymized several of the western races. Moreover, Diersing (1978) noted that the taxonomy of populations in the eastern United States has been obscured by numerous introductions during the past 60 years. Diersing (1978) assigned the two populations introduced into the province to the same subspecies as the original founding stocks.

Sylvilagus floridanus alacer

Original Description. Bangs 1896: Proc. Biol. Soc. Wash. 10:136.
Type Locality. Stillwell, Adair Co., Oklahoma.
Type Specimen. MCZ B5480.
Range. The grasslands of Texas, Oklahoma, Missouri, Arkansas and Louisiana. Individuals from this race were introduced into western Washington in 1927 and 1931 and subsequently spread into the lower Fraser Valley of southwestern British Columbia.
Remarks. Diersing (1978) classified the *S. floridanus* from western Oregon, Washington and the lower Fraser Valley of the province as *S. f. alacer*.

Sylvilagus floridanus mearnsi

Original Description. Allen 1894: Bull. Amer. Mus. Nat. Hist. 6:171.
Type Locality. Fort Snelling, Mennepin Co., Minnesota.
Type Specimen. AMNH 4483/3498.
Range. Southern Quebec, Ontario, and the eastern and north- central United States. In British Columbia it is confined to southern Vancouver Island where populations from southern Ontario were introduced to the Sooke area in 1964.
Remarks. Diersing (1978) classified the introduced population on Vancouver Island as *S. f. mearnsi*.

Sylvilagus nuttallii (Bachman, 1837)

Nuttall's Cottontail

This is a western rabbit associated with the grasslands and intermontane regions of the western United States, southern Alberta and Saskatchewan and south-central British Columbia.

SYNONYMS. *Sylvilagus nutallii*

OTHER COMMON NAMES. Mountain Cottontail.

SUBSPECIES. Subspecies were revised by Diersing (1978); he recognized two subspecies, one occurs in the province.

Sylvilagus nuttallii nuttallii

Original Description. Bachman 1837: J. Acad. Nat. Sci. Phil. 7:345.
Type Locality. Mouth of the Malheur River, Mahleur Co., Oregon.
Type Specimen. ANSP 382.
Range. The western United States (Washington, Idaho, Montana, Oregon, California, Nevada, Arizona, Utah) and the Similkameen and Okanagan valleys of southern British Columbia.

Family Ochotonidae — Pikas

Genus *Ochotona*

North American species were first revised by Howell (1924). Weston (1981, 1982) evaluated the taxonomy and systematic relationships among North American and Eurasian species using numerical methods. Two species occur in North America; both inhabit British Columbia.

Ochotona collaris (Nelson, 1893)

Collared Pika

Nelson, 1893. Proc. Biol. Soc. Washington 8:117. Type Locality, near head of Tanana River, Alaska. Type Specimen, USNM 36297/14384.

O. collaris inhabits Alaska, the Yukon Territory, the Northwest Territories and British Columbia where it is restricted to the extreme northwestern part of the province. Its relationship with the other North American pika (*O. princeps*) and the Old World species has been controversial. Howell (1924) classified the collared pika as a distinct species *O. collaris*, but Broadbrooks (1965) and Youngman (1975) consider the two North American pikas (*O. princeps* and *O. collaris*) to be conspecific, and Corbet (1978) suggested that the North American pikas and the Old World pika *O. alpina* were representatives of a single species. In a comprehensive study, Weston (1981, 1982) demonstrated that the collared pika of northwestern North America was a distinct species (*O. collaris*).

SYNONYMS. *Lagomys collaris*, *Ochotona princeps collaris*.

OTHER COMMON NAMES. None.

SUBSPECIES. None are recognized, but geographic variation has not been assessed in this species.

Ochotona princeps (Richardson, 1828)

Common Pika

This pika inhabits the mountainous regions of North America from central British Columbia to California and New Mexico. It occupies the coastal and interior mountain ranges in the central and southern part of the province where its range is fragmented into a number of disjunct populations. The geographic ranges of *O. collaris* and *O. princeps* in British Columbia are separated by a hiatus of about 800 km.

SYNONYMS. *Lagomys minimus*, *Ochotona cuppes*, *Ochotona fenisex*, *Ochotona fenisex brunnescens*, *Ochotona minimus*.

OTHER COMMON NAMES. Rocky Mountain Pika, Pika

SUBSPECIES. Subspecies were first revised by Howell (1924); Cowan (1954) revised subspecies for British Columbia and Alberta. Hall (1981) listed 36 subspecies; 8 occur in the province. Weston (1982), however, reported considerable overlap in skull morphology among five subspecies (*fenisex*, *cuppes*, *brunnescens*, *princeps*, *lutescens*) from British Columbia; her results suggest that a modern study of geographic variation is needed.

Ochotona princeps brooksi

Original Description. Howell 1924: N. Amer. Fauna 47:30.
Type Locality. Sicamous, British Columbia.
Type Specimen. USNM 69275.
Range. Restricted to British Columbia where it is known from the plateau area south of Shuswap Lake.

Ochotona princeps brunnescens

Original Description. Howell 1919: Proc. Biol. Soc. Wash. 32:108.
Type Locality. Keechelus, Kittitas Co., Washington.
Type Specimen. USNM 227259.
Range. Western slopes of the coastal mountain ranges from northern California to British Columbia where it extends as far north as Garibaldi Provincial Park.

Ochotona princeps cuppes

Original Description. Bangs 1899: Proc. New England Zool. Club: 1:40.
Type Locality. Monashee Divide, Gold Range, 4,000 ft. (1,220 m), British Columbia.
Type Specimen. MCZ B7389.
Range. The Selkirk, Purcell and Monashee mountains in British Columbia, northern Idaho, extreme northeastern Washington and extreme northwestern Montana.

Ochotona princeps fenisex

Original Description. Lord 1823: Proc. Zool. Soc. London: 96.
Type Locality. Ptarmigan Hill, near head of the Ashnola River, east slope of the Cascade Range, 7,000 ft. (2,135 m), British Columbia.
Type Specimen. BMNH 62.12.30.11/1443a.
Range. Eastern slopes of the coastal mountain ranges from the Columbia River in Washington to the east slope of the Cascade and Coast mountains in the province where it also inhabits the Chilcotin Plateau from Kimsquit to the United States border.

Ochotona princeps littoralis

Original Description. Cowan 1954: Murrelet 35:22.
Type Locality. Hagensborg, British Columbia.
Type Specimen. NMC 15825.
Range. Restricted to the province where it inhabits the west slope of the Coast Mountains from Bella Coola to Bute Inlet.

Ochotona princeps princeps

Original Description. Richardson 1828: Zool. Journ. 3:520.
Type Locality. "Headwaters of the Athabasca River", Alberta.
Type Specimen. None designated.
Range. Rocky Mountains in Montana, Idaho, Alberta and British Columbia where it ranges from Mount Robson and the Yellowhead Pass south to the United States border.

Ochotona princeps saturatus

Original Description. Cowan 1954: Murrelet 35:23.
Type Locality. Mt. Huntley, Wells Gray Provincial Park, British Columbia.
Type Specimen. UBC 3218.
Range. Known from only the type locality, but according to Cowan (1954), it may inhabit the entire Cariboo Mountain Range in the province.

Ochotona princeps septentrionalis

Original Description. Cowan and Racey 1946: Can. Field-Nat. 60:102.
Type Locality. Itcha Mountains, 6,500 ft. (1,983 m), British Columbia.
Type Specimen. NMC 34513.
Range. Although Cowan (1954) restricted its range to the type locality, populations from the Ilgachuz Mountains also may belong to this subspecies.

Order Rodentia — Rodents

Family Aplodontidae — Mountain Beavers

Genus *Aplodontia*

The genus was revised by Taylor (1918); there is one species in the genus.

Aplodontia rufa (Rafinesque, 1817)

Mountain Beaver

A. rufa inhabits the coastal lowlands and coastal mountains of California, Oregon, Washington and southern British Columbia.

SYNONYMS. *Aplodontia californica*, *Aplodontia chryseola*, *Aplodontia major*, *Aplodontia olympica*, *Aplodontia rufa columbiana*.

OTHER COMMON NAMES. None.

SUBSPECIES. Nine subspecies were recognized by Taylor (1918) and Finley (1941). Dalquest and Scheffer (1945) reduced the number of subspecies to seven; two are found in the province. A modern study of geographic variation is needed.

Aplodontia rufa rainieri

Original Description. Merriam 1899: Proc. Biol. Soc. Wash. 13:21.
Type Locality. Paradise Creek, Mt. Rainier, 5,200 ft. (1,586 m), Lewis Co., Washington.
Type Specimen. USNM 90144.
Range. The Cascade Mountains in Washington and British Columbia where it extends from Allison Pass in Manning Provincial Park to the Nicola Valley.

Aplodontia rufa rufa

Original Description. Rafinesque 1817: Amer. Monthly Mag. 2:45.
Type Locality. "Neighbourhood" of Columbia River, Oregon.
Type Specimen. None designated.
Range. Western California, Oregon, Washington and extreme southwestern British Columbia where it is restricted to the lower Fraser Valley.

Family Arvicolidae — Voles and Lemmings

Genus *Clethrionomys*

Systematic relationships among North American and Eurasian taxa has been controversial. Three species are currently recognized in North America; two are found in the province.

Clethrionomys gapperi (Vigors, 1830)

Southern Red-backed Vole

C. gapperi has an extremely large range across the boreal regions of Canada and the United States. In British Columbia it occupies the northeastern, central and southern mainland, and some coastal islands. In Alaska, the Yukon Territory, the Northwest Territories and northern British Columbia, *C. gapperi* is replaced by the Northern Red-backed Vole (*C. rutilus*); south of the Columbia River in the Pacific Northwest, *C. gapperi* is replaced by the Western Red-backed Vole (*C. californicus*). Taxonomic history of these three forms has been complex and controversial. *C. gapperi* and *C. rutilus* are similar in morphology although biochemical and behavioural differences have been reported (Canham and Cameron 1972; McPhee 1977; Nadler *et al.* 1978). Bee and Hall (1956) suggested that they represent extremes in a cline and therefore should be classified as a single species. Youngman (1975) also considered *C. rutilus* and *C. gapperi* as conspecific but presented no

evidence to support his conclusion. Rausch and Rausch (1975a), Hall (1981), and Honacki *et al.* (1982) classified the two taxa as distinct species. McPhee (1977), who studied a contact zone between *C. gapperi* and *C. rutilus* in the Northwest Territories, found little hybridization between the two taxa and concluded that they are separate species. Distributions of *C. rutilus* and *C. gapperi* may come into contact in the northern part of the province, but the precise limits of their ranges in this region is poorly known. Cowan and Guiguet (1965) showed a large hiatus separating *C. rutilus* and *C. gapperi* in north-central and northwestern British Columbia, but this may be an artifact of inadequate collecting. In the northeast, the two species are separated by the Summit Lake Pass (Rand 1944; Canham and Cameron 1972). In the Stikine River valley of western British Columbia, specimens of *C. rutilus* and *C. gapperi* have been taken about 32 km apart and their ranges may come into contact in this area (Swarth 1922).

Systematics of coastal populations of *Clethrionomys* also have been problematic. Taxonomists have long recognized that a distinct species of *Clethrionomys* inhabits the Pacific coast and they have applied either the names *C. occidentalis* or *C. californicus* to the species. But there has been considerable disagreement on the precise range of this coastal species. Hall and Cockrum (1952) considered this taxon (i.e. *C. occidentalis*) to include all coastal populations of *Clethrionomys* from northern California to northern British Columbia. Sheppe (1960) and Cowan and Guiguet (1965) restricted its northern limits to the lower Fraser Valley and they classified coastal populations north of Burrard Inlet as *C. gapperi*. Based on the recommendation of Johnson and Ostenson (1959), Honacki *et al.* (1982) treated all *Clethrionomys* north of the Columbia River as *C. gapperi* and coastal *Clethrionomys* south of the Columbia River as a separate species *C. californicus*. A modern study is needed to resolve the taxonomy of coastal *Clethrionomys*.

SYNONYMS. *Clethrionomys occidentalis*, *Clethrionomys occidentalis caurinus*, *Clethrionomys occidentalis occidentalis*, *Evotomys caurinus*, *Evotomys galei*, *Evotomys gapperi*, *Evotomys gapperi athabascae*, *Evotomys gapperi saturatus*, *Evotomys occidentalis*, *Evotomys phaeus*.

OTHER COMMON NAMES. Gapper's Red-backed Vole, Boreal Redback Vole.

SUBSPECIES. Geographic variation and subspecies were assessed in populations from the southern Rocky Mountains (Cockrum and Fitch 1952) and the Pacific Northwest (Sheppe 1960). There has been no comprehensive study throughout the entire range, however, and the species is in need of a modern revision. Hall (1981) listed 29 subspecies; 8 occur in the province.

Clethrionomys gapperi athabascae

Original Description. Preble 1908: N. Amer. Fauna 27:178.
Type Locality. Fort Smith, Slave River, Northwest Territories.
Type Specimen. USNM 109945.
Range. The southern Northwest Territories, northeastern British Columbia, northern Alberta, Saskatchewan and Manitoba. Hall (1981) indicated that this race was restricted to northeastern British Columbia, but Cowan and Guiguet (1965) showed the range extending down the Rocky Mountains as far south as Tornado Pass.

Clethrionomys gapperi cascadensis

Original Description. Booth 1945: Murrelet 26:27.
Type Locality. Blewett Pass, 3,000 ft. (915 m), Kittitas Co., Washington.
Type Specimen. USNM 242380.
Range. The coastal mountains from Washington to Garibaldi Provincial Park.

Clethrionomys gapperi caurinus

Original Description. Bailey 1898: Proc. Biol. Soc. Wash. 12:21.
Type Locality. Lund, east shore of Malaspina Inlet, British Columbia.
Type Specimen. USNM 89460.
Range. A coastal race restricted to the province where it ranges from Jervis Inlet to Lowe Inlet. It also inhabits several offshore islands: Dufferin, Horsefall, Smythe, Princess Royal, Sonora and Hardwicke.

Clethrionomys gapperi galei

Original Description. Merriam 1890: N. Amer. Fauna 4:23.
Type Locality. Ward, 9,500 ft. (2,898 m), Boulder Co., Colorado.
Type Specimen. USNM 186491.
Range. The Rocky Mountains from Colorado north to southern Alberta and extreme southeastern British Columbia (Akamina Pass).

Clethrionomys gapperi occidentalis

Original Description. Merriam 1890: N. Amer. Fauna 4:25.
Type Locality. Aberdeen, Chehalis (= Grays Harbor) Co., Washington.
Type Specimen. USNM 17447/24351.
Range. West of the Cascade Mountains in Washington; restricted to the lower Fraser Valley in the province.
Remarks. Cowan and Guiguet (1965) treated *occidentalis* as a separate species, but Johnson and Ostenson (1959) and Honacki *et al.* (1982) classified *occidentalis* as a subspecies of *C. gapperi*. The occurrence of this race in the province is based on a single specimen from Point Grey (Cowan and Guiguet 1965).

Clethrionomys gapperi phaeus

Original Description. Swarth 1911: Univ. California Publ. Zool. 7:127.
Type Locality. Marten Arm, Boca de Quadra, Alaska.
Type Specimen. MVZ 8742.
Range. Restricted to southeastern Alaska and western British Columbia where it is confined to the vicinity of the Portland Canal and Portland Inlet.

Clethrionomys gapperi saturatus

Original Description. Rhoads 1894: Proc. Acad. Nat. Sci. Phil. 46:284
Type Locality. Nelson, British Columbia.
Type Specimen. ANSP 7483.
Range. Northern Washington, Idaho, Montana and British Columbia where it occupies a broad region east of the coastal mountains and west of the Rocky Mountains.

Clethrionomys gapperi stikinensis

Original Description. Hall and Cockrum 1952: Univ. Kansas, Mus. Nat. Hist. 5:305.
Type Locality. Stikine River at Great Glacier, British Columbia.
Type Specimen. MVZ 30735.
Range. Cleveland Peninsula of southeastern Alaska and the Stikine River area of British Columbia.

Clethrionomys rutilus (Pallas, 1778)

Northern Red-backed Vole

This vole has a broad range across Eurasia and northwestern North America where it occupies Alaska, the Yukon Territory, the Northwest Territories and northern British Columbia. Taxonomic relationships with the Southern Red-backed Vole (*C. gapperi*) are discussed in the account for *C. gapperi*.

SYNONYMS. *Clethrionomys dawsoni*, *Clethrionomys dawsoni dawsoni*, *Evotomys dawsoni*.

OTHER COMMON NAMES. Tundra Redback Vole.

SUBSPECIES. Manning (1956) assessed geographic variation and subspecies in Canada. Eight subspecies were recognized in North America by Hall (1981); one inhabits the province. Rausch and Rausch (1975a) noted that the continental subspecies in North America are weakly differentiated.

Clethrionomys rutilus dawsoni

Original Description. Merriam 1888: Am. Nat. 22:650.
Type Locality. Finlayson River, 3,000 ft. (915 m), Yukon Territory.
Type Specimen. NMC 92.
Range. Broadly distributed across the Yukon Territory, the Northwest Territories and the northern part of the province where it ranges from the extreme northwest (Haines Triangle) to Summit Pass on the Alaskan Highway. The boundary between *C. rutilus* and *C. gapperi* in northern British Columbia is discussed in the account for *C. gapperi*.

Genus *Lemmus*

There are four species in the genus; one occurs in North America. The genus was revised by Rausch and Rausch (1975b).

Lemmus sibiricus (Kerr, 1792)

Brown Lemming

L. sibiricus has a broad range across Siberia and North America where it inhabits arctic and alpine tundra in Alaska, the Yukon Territory, the Northwest Territories, Manitoba, British Columbia and Alberta. Although taxonomic relationships among North American and Eurasian forms have been controversial, all North American Brown Lemmings are now considered to be a single species *Lemmus sibiricus*. This species also inhabits the arctic tundra of Siberia (Rausch and Rausch 1975b).

SYNONYMS. *Arvicola helvolus*, *Lemmus helvolus*, *Lemmus trimucronatus*, *Lemmus trimucronatus helvolus*.

OTHER COMMON NAMES. Siberian Lemming.

SUBSPECIES. Davis (1944), who revised North American subspecies under the name *Lemmus trimucronatus*, recognized five subspecies. Rausch and Rausch (1975b) and Hall (1981) listed nine subspecies for North America; one occurs in the province. Multivariate patterns of size variation, however, are inconsistent with nine distinct races (Eger 1983).

Lemmus sibiricus helvolus

Original Description. Richardson 1828: Zool. J. 3:517.
Type Locality. Rocky Mountains, Alberta (see Smith and Edmonds 1985).
Type Specimen. Not known to exist.
Range. The southern Yukon Territory, the extreme southwestern Northwest Territories, Alberta and British Columbia where it occupies alpine and subalpine habitats in northern and central regions.

Genus *Microtus*

The genus encompasses a large number of taxa. Several taxonomic and nomenclatural problems remain to be resolved and there is disagreement on the limits of the genus and the number of valid species (Honacki *et al*. 1982; Carleton 1985). Twenty- three species currently are recognized in North America; seven occur in the province. A general overview of North American species is in Bailey (1900) and Anderson (1985).

Microtus longicaudus (Merriam, 1888)

Long-tailed Vole

A western species, this vole ranges from Alaska, the Yukon Territory and the western Northwest Territories to the southwestern United States. In British Columbia it occupies the entire mainland and some coastal islands.

SYNONYMS. *Arvicola longicaudus*, *Arvicola mordax*, *Microtus cautus*, *Microtus macurus*, *Microtus mordax*, *Microtus vellerosus*.

OTHER COMMON NAMES. None.

SUBSPECIES. Anderson and Rand (1944) reviewed subspecies in Canada; Long (1965) revised subspecies from the Great Plains. However, there has been no comprehensive study of variation throughout the range. Hall (1981) listed 15 subspecies; four occur in the province.

Microtus longicaudus littoralis

Original Description. Swarth 1933: Proc. Biol. Soc. Wash. 40:209.
Type Locality. Shakan, Prince of Wales Island, Alexander Archipelago, Alaska (see Csuti 1980).
Type Specimen. MVZ 8642.
Range. The mainland coast and Alexander Islands of southeastern Alaska and the Stikine River area of northwestern British Columbia.

Microtus longicaudus longicaudus

Original Description. Merriam 1888: Amer. Nat. 22:934.
Type Locality. Custer, Black Hills, 5,500 ft. (1,678 m), South Dakota.
Type Specimen. USNM 186496.
Range. A broad range across western North America. It is restricted to the southern dry interior of the province where it occurs as far north as Kamloops and Shuswap.
Remarks. Populations inhabiting the southern dry interior of the province were classified as *M. l. mordax* by Anderson and Rand (1944) and Cowan and Guiguet (1965). However, Long (1965) concluded that *M. l. mordax* and *M. l. longicaudus* were indistinguishable.

Microtus longicaudus macurus

Original Description. Merriam 1898: Proc. Acad. Nat. Sci. Phil. 50:353.
Type Locality. Lake Cushman, Olympic Mountains, Mason Co., Washington.
Type Specimen. USNM 66151.
Range. Coastal regions of western Washington and British Columbia where it extends from Vancouver to Dean Channel.

Microtus longicaudus vellerosus

Original Description. Allen 1899: Bull. Amer. Mus. Nat. Hist. 12:7.
Type Locality. Upper Liard River, British Columbia.
Type Specimen. AMNH 14403.
Range. Widely distributed across eastern Alaska, the Yukon Territory, the western Northwest Territories, western Alberta, and northern, central and southeastern British Columbia throughout the Selkirk, Purcell, Monashee and Rocky mountains.

Microtus montanus (Peale, 1848)

Montane Vole

M. montanus occupies the western United States east of the coastal mountain ranges to the Rocky Mountains. In Canada, where it is at the northern periphery of its range, it is restricted to the dry interior of southern British Columbia.

SYNONYMS. *Microtus canicaudus*, *Microtus nanus canescens*.

OTHER COMMON NAMES. Mountain Vole.

SUBSPECIES. Sixteen subspecies were recognized in the revision by Anderson (1959); one is found in the province.

Microtus montanus canescens

Original Description. Bailey 1898: Proc. Biol. Soc. Wash. 12:87.
Type Locality. Conconcully, Okanagan Co., Washington.
Type Specimen. USNM 90577.
Range. Eastern Washington and the dry interior of the province from the Okanagan Valley to Williams Lake.

Microtus oeconomus (Pallas, 1776)

Tundra Vole

M. oeconomus has a vast range across the taiga and tundra of Eurasia, Alaska, the Yukon Territory, the Northwest Territories and extreme northwestern British Columbia.

SYNONYMS. *Microtus operarius*, *Microtus yakutatensis*.

OTHER COMMON NAMES. Root Vole.

SUBSPECIES. Alaskan subspecies were revised by Paradiso and Manville (1961), but there has been no recent revision of Canadian populations. Hall (1981) listed ten subspecies in North America; one occurs in the province.

Microtus oeconomus yakutatensis

Original Description. Merriam 1900. Proc. Wash. Acad. Sci. 2:22.
Type Locality. North shore of Yakutat Bay, Alaska.
Type Specimen. USNM 98005.
Range. Southeastern Alaska and extreme northwestern British Columbia where there are records from the Haines Triangle and the Cassiar Mountains.
Remarks. Although Cowan and Guiguet (1965) and Hall (1981) assigned British Columbia populations to *M. o. yakutatensis*, they are situated in a transitional area between *M. o. macfarlani* and *M. o. yakutatensis*.

Microtus oregoni (Bachman, 1839)

Creeping Vole

A Pacific coast species, *M. oregoni* inhabits the coastal lowlands and coastal mountain ranges from northern California to southwestern British Columbia.

SYNONYMS. *Microtus serpens*.

OTHER COMMON NAMES. Oregon Vole.

SUBSPECIES. Five subspecies were recognized in the revision by Hatfield and Hooper (1935); Hall (1981) listed four subspecies with one occurring in the province. The species is in need of a taxonomic revision.

Microtus oregoni serpens

Original Description. Merriam 1897: Proc. Biol. Soc. Wash. 11:75.
Type Locality. Agassiz, British Columbia.
Type Specimen. USNM 76303.
Range. Northwestern Washington and southwestern British Columbia from Vancouver to Allison Pass in Manning Provincial Park.

Microtus pennsylvanicus (Ord, 1815)

Meadow Vole

With the broadest geographic range of any *Microtus* in North America, *M. pennsylvanicus* inhabits much of Alaska, Canada and the United States from the western Cordillera to the southwestern states and extreme northern Mexico. In British Columbia it occupies the entire mainland east of the coastal mountain ranges.

SYNONYMS. *Arvicola drummondii*, *Arvicola modesta*, *Microtus pennsylvanicus funebris*, *Microtus pennsylvanicus rubidus*, *Microtus stonei*.

OTHER COMMON NAMES. None.

SUBSPECIES. Hall (1981) recognized 26 subspecies in North America. Dale (1940) classified British Columbia populations into four subspecies: *drummondii*, *microcephalus*, *funebris*, and *rubridus*; this taxonomy was adopted by Hall (1981). However, Rand (1943) and Cowan and Guiguet (1965) concluded that there are only two races in the province: *drummondii* and *modestus*. In a recent multivariate study of cranial measurements, Snell and Cunnison (1983) demonstrated that geographic variation in this species is a mosaic pattern with no conspicuous groupings. Thus the classification of populations into subspecies may be inappropriate for this vole.

Microtus pennsylvanicus drummondii

Original Description. Audubon and Bachman 1854: Quad. N. Amer. 3:106.
Type Locality. "Valley of the Rocky Mountains" (probably near Jasper House, Alberta).
Type Specimen. Not known to exist.
Range. A vast range across Alaska, the Yukon Territory, the Northwest Territories, British Columbia, Alberta, Saskatchewan, Manitoba and Ontario. It inhabits the entire mainland east of the coastal mountain ranges except for the extreme southern part of the province.

Microtus pennsylvanicus modestus

Original Description. Baird 1857: Mamm. N. Amer.:535.
Type Locality. Cochetapa ("Sawatch") Pass, Saguache Co., Colorado.
Type Specimen. USNM 594/1717.
Range. Rocky Mountains of the United States from New Mexico to northern Montana, central Idaho and eastern Washington and the southern interior of the province from the extreme southern Okanagan to the Rocky Mountain Trench. According to Cowan and Guiguet (1965), it is replaced by *M. p. drummondii* at higher elevations.

Microtus richardsoni (DeKay, 1842)

Water Vole

This vole is associated with subalpine and alpine areas in the Cordillera of western North America. The arid intermontane basins are not inhabited by *M. richardsoni* and these regions separate its range into disjunct western and eastern populations. Western populations inhabit the coastal mountain ranges from Oregon to southern British Columbia; eastern populations occupy the Cordillera from Utah to central British Columbia and Alberta.

SYNONYMS. *Arvicola richardsoni*, *Aulacomys arvicoloides*, *Microtus principalis*.

OTHER COMMON NAMES. Richardson's Vole.

SUBSPECIES. There has been no recent revision of the species. Hall (1981) listed four subspecies; two occur in British Columbia: *arvicoloides* and *richardsoni*. Cowan and Guiguet (1965) considered these two races inseparable and classified all populations in the province as *M. r. richardsoni*. A modern study is needed to assess the validity of these races.

Microtus richardsoni arvicoloides

Original Description. Rhoads 1894: Amer. Nat. 28:182.
Type Locality. Lake Keechelus, 8,000 ft. (2,440 m), Kittitas Co, Washington.
Type Specimen. ANSP 8358.
Range. The coastal mountain ranges from Oregon to southern British Columbia where it inhabits the Cascades and the southern Coast Mountains as far north as Lillooet.

Microtus richardsoni richardsoni

Original Description. DeKay 1842: Zool. New York Mammals: 91.
Type Locality. Vicinity of Jasper House, Alberta.
Type Specimen. None designated.
Range. The Rocky Mountains of Canada and the Selkirk, Purcell and Monashee mountains in British Columbia.

Microtus townsendii (Bachman, 1839)

Townsend's Vole

A Pacific coast species, this vole ranges from northern California to the Vancouver area of British Columbia. It occurs also on numerous islands including the San Juan Islands in Washington, Vancouver Island and some adjacent islands.

SYNONYMS. *Arvicola occidentalis*, *Arvicola tetramerus*, *Arvicola townsendii*.

OTHER COMMON NAMES. None.

SUBSPECIES. There has been no recent review of subspecies. Hall (1981) recognized six subspecies; four are found in the province. Specimens from islands off the east and west coasts of Vancouver Island have never been formally described or assigned to a subspecies.

Microtus townsendii cowani

Original Description. Guiguet 1955: Ann. Rept. Prov. Mus. Nat. Hist. and Anthrop.: B67.
Type Locality. Triangle Island, Scott Islands, British Columbia.
Type Specimen. RBCM 5460.
Range. An insular race restricted to Triangle Island.

Microtus townsendii cummingi

Original Description. Hall 1936: Murrelet 17:15.
Type Locality. Bowen Island, British Columbia.
Type Specimen. MVZ 68836.
Range. An insular race restricted to Bowen and Texada Islands.
Remarks. Mitochondrial DNA of the Bowen Island population demonstrates no differentiation from mailand populations (Thomas and Beckenbach 1986).

Microtus townsendii laingi

Original Description. Anderson and Rand 1943: Can. Field-Nat. 57:74.
Type Locality. Port Hardy, Vancouver Island, British Columbia.
Type Specimen. NMC 13423.
Range. An insular race found on northern Vancouver Island and on Hope, Hurst and Nigei islands in the Gordon-Goletas group (Cowan and Guiguet 1965).
Remarks. Populations on Vargas, Moketas, Union and Little Bunsby islands off the northwest coast of Vancouver Island may be additional insular populations of *M. t. laingii*. Cowan and Guiguet (1965) classified the Little Bunsby and Vargas islands populations as *M. t. tetramerus*, although these islands are north of the range of this subspecies.

Microtus townsendii tetramerus

Original Description. Rhoads 1894: Proc. Acad. Nat. Sci. 46:283.
Type Locality. Beacon Hill Park, Victoria, Vancouver Island, British Columbia.
Type Specimen. ANSP 327.
Range. An insular race that occupies southern Vancouver Island, and Saltspring and Pender islands in the Gulf Islands. Specimens from other Gulf Islands, as well as from Quadra, Denman and Hornby islands off the east coast of Vancouver Island, and East Turtle, Fleming, Tzartus, West Jarvis, Dodd and Sanford islands in Barkley Sound have not been assigned to a subspecies, but they probably represent additional populations of *tetramerus*.

Remarks. Thomas and Beckenbach (1986) demonstrated that the Vancouver Island populations (ie., *laingi* and *tetramerus*) are strongly divergent from mainland populations in their mitochondrial DNA.

Microtus townsendii townsendii

Original Description. Bachman 1839: J. Acad. Nat. Sci. Phil. 8:60.
Type Locality. Columbia River, Oregon.
Type Specimen. None designated.
Range. West of the Cascade Mountains in northern California, Oregon, Washington and southwestern British Columbia where it ranges as far north as Burrard Inlet and east to Chilliwack.

Genus *Ondatra*

There is one species in the genus.

Ondatra zibethicus (Linnaeus, 1776)

Muskrat

Distributed across most of North America, *O. zibethicus* occupies the entire mainland of the province and the Queen Charlotte Islands and Vancouver Island where it was introduced in the 1920s (Carl and Guiguet 1972).

SYNONYMS. *Fiber osoyoosensis*, *Fiber spatulatus*, *Ondatra zibethica*.

OTHER COMMON NAMES. None.

SUBSPECIES. Pietsch (1970) and Boyce (1978) analysed patterns of cranial variation throughout North America. Although 16 subspecies were listed by Hall (1981), Pietsch (1970) regarded only 12 of these as valid. Two races are found in the province.

Ondatra zibethicus osoyoosensis

Original Description. Lord 1863: Proc. Zool. Soc. London: 97.
Type Locality. Osoyoos Lake, British Columbia.
Type Specimen. BMNH 62.12.30.6.
Range. The western United States, southwestern Alberta and southern British Columbia. Populations of this race were introduced to Vancouver Island and the Queen Charlotte Islands in the 1920s.
Remarks. Differentiation among these introduced island populations and their divergence from the original mainland stock has not been studied.

Ondatra zibethicus spatulata

Original Description. Osgood 1900: N. Amer. Fauna. 19:36.
Type Locality. Lala Marsh, Yukon Territory.
Type Specimen. USNM 98567.
Range. Alaska, the Yukon Territory, the Northwest Territories and north-central British Columbia.

Genus *Phenacomys*

Taxonomy of this genus has been problematic. The genus was first revised by Howell (1926); he recognized four groups of species. Two of his groups (*albipes* and *longicaudus*), representing the tree mice of Oregon and California, are now treated as a separate genus *Arborimus* (Johnson 1973). His other groups (*intermedius* and *ungava*) are now classified as a single species, *P. intermedius* (Honacki *et al.* 1982).

Phenacomys intermedius Merriam, 1889

Heather Vole

A boreal species, *P. intermedius* is widely distributed across Canada and the boreal-montane regions of the western United States. Taxonomic relationships between eastern and western

populations are still unresolved. Some taxonomists have treated these two groups of populations as distinct species, *P. intermedius* and *P. ungava* (Anderson 1942; Cowan and Guiguet 1965); others considered them a single species, *P. intermedius* (Crowe 1943; Honacki *et al.* 1982). Hall (1981) speculated that *P. intermedius* may be a composite of several allopatric species. Some of this taxonomic uncertainty can be attributed to the fact that the Heather Vole is poorly represented in museum collections. Small sample sizes and large geographic distances separating samples has prohibited a rigorous study of geographic variation across the range.

SYNONYMS. *Microtus pumilus*, *Phenacomys constablei*, *Phenacomys mackenzii*, *Phenacomys olympicus*, *Phenacomys oramontis*, *Phenacomys ungava mackenzii*.

OTHER COMMON NAMES. None.

SUBSPECIES. Nine subspecies are recognized; five inhabit the province (Hall 1981). The large geographic gaps shown by Cowan and Guiguet (1965) separating races in British Columbia probably reflect sampling bias. The boundaries delimiting the five races described here are based on Hall (1981).

Phenacomys intermedius intermedius

Original Description. Merriam 1889: N. Amer. Fauna 2:32.
Type Locality. Basaltic plateau, 5,500 ft. (1,678 m), about 20 mi. NNW of Kamloops, British Columbia.
Type Specimen. NMC 780.
Range. Cordillera of the western United States; in British Columbia it ranges throughout the central interior east to the Rocky Mountain Trench and west to the Coast Mountains.

Phenacomys intermedius laingi

Original Description. Anderson 1942: Can. Field-Nat. 56:59.
Type Locality. Kimsquit River, Cornice Creek, near the head of Dean Inlet, 2,500 ft. (763 m), British Columbia.
Type Specimen. NMC 16528.
Range. Restricted to the province where it occupies the central Coast Mountains and east to the Cariboo Mountains.

Phenacomys intermedius levis

Original Description. Howell 1923: Proc. Biol. Soc. Wash. 36:157.
Type Locality. Saint Mary's Lake, Teton Co., Montana.
Type Specimen. USNM 72405.
Range. The Rocky Mountains of Alberta, northern Montana and British Columbia where it ranges as far north as the Peace River.
Remarks. Cowan and Guiguet (1965) reported that this race was restricted to the extreme southern Rocky Mountains of British Columbia (Tornado Pass).

Phenacomys intermedius mackenzii

Original Description. Preble 1902: Proc. Biol. Soc. Wash. 15:182.
Type Locality. Fort Smith, Slave River, Northwest Territories.
Type Specimen. USNM 110625.
Range. Broadly distributed across the Yukon Territory, the Northwest Territories, Alberta, Saskatchewan, Manitoba and northern parts of the province.

Phenacomys intermedius oramontis

Original Description. Rhoads 1895: Amer. Nat. 29:941.
Type Locality. Church Mountain (= Lihumitson Mountain), 6,000 ft. (1,830 m), Lihumitson Park, Mount Baker Range, British Columbia.
Type Specimen. ANSP 9354.
Range. The coastal mountains in northern Oregon, western Washington and British Columbia where it extends as far north as Garibaldi Provincial Park.

Genus *Synaptomys*

The genus was revised by Howell (1927). There are two species in North America; one is found in the province.

Synaptomys borealis (Richardson, 1828)

Northern Bog Lemming

This is a boreal species distributed from Alaska and Canada, to extreme northern Minnesota, Idaho, Montana and Washington.

SYNONYMS. *Arvicola borealis*, *Synaptomys andersoni*, *Synaptomys ballatus*, *Synaptomys borealis wrangeli*, *Synaptomys chapmani*, *Synaptomys dalli*, *Synaptomys truei*, *Synaptomys wrangeli*.

OTHER COMMON NAMES. None.

SUBSPECIES. There has been no recent revision of the species. Hall (1981) listed nine subspecies; five occur in the province.

Synaptomys borealis artemisiae

Original Description. Anderson 1932: Nat. Mus. Canada, Ann. Rept. 1931:104.
Type Locality. Sixmile Creek (= Stevenson Creek), 2,400 ft. (732 m), SW of Princeton, British Columbia.
Type Specimen. NMC 7952.
Range. Restricted to the Similkameen and Okanagan Valleys in the province.

Synaptomys borealis borealis

Original Description. Richardson 1828: Zool. Journ. 3:517.
Type Locality. Fort Franklin, Great Bear Lake, Northwest Territories.
Type Specimen. BMNH 42.10.7.10.
Range. The Northwest Territories, northern Alberta and Saskatchewan and northeastern British Columbia.

Synaptomys borealis chapmani

Original Description. Allen 1903: Bull. Amer. Mus. Nat. Hist. 19:555.
Type Locality. Glacier, Selkirk Mountains, British Columbia.
Type Specimen. AMNH 16908.
Range. Rocky Mountains of Alberta, northwestern Montana, northeastern Washington, and the Rocky, Purcell and Selkirk mountains in British Columbia.

Synaptomys borealis dalli

Original Description. Merriam 1896: Proc. Biol. Soc. Wash. 10:62.
Type Locality. Nulato, Alaska.
Type Specimen. USNM 49373.
Range. Alaska, the Yukon Territory, and the northern interior of the province, east of the Coast Mountains, south to Quesnel.

Synaptomys borealis truei

Original Description. Merriam 1896: Proc. Biol. Soc. Wash. 10:62.
Type Locality. Skagit Valley, Skagit Co., Washington.
Type Specimen. USNM 3798/12101.
Range. Southeastern Alaska including the Alexander Archipelago, the entire coastal mainland of the province and extreme northwestern Washington. There are also records in the province for Campbell and Yeo islands.
Remarks. Cowan and Guiguet (1965) assigned this coastal race to *S. b. wrangeli*, but Hall (1981) applied the subspecies name *S. b. truei*.

Family Castoridae — Beavers

Genus *Castor*

One species occurs in North America.

Castor canadensis Kuhl, 1820

Beaver

C. canadensis is found throughout the North American continent. In British Columbia it inhabits the entire mainland, Vancouver Island and numerous islands off the northern coast. Populations were introduced to the Queen Charlotte Islands from Vancouver Island in 1950 (Carl and Guiguet 1972).

SYNONYMS. None.

OTHER COMMON NAMES. American Beaver.

SUBSPECIES. Hall (1981) listed 24 subspecies for North America; 4 occur in the province. Nonetheless, there has been no recent analysis of geographic variation and the validity of some of these races is questionable.

Castor canadensis belugae

Original Description. Taylor 1916: Univ. Calif. Publ. Zool. 12:429.
Type Locality. Beluga River, Cook Inlet, Alaska.
Type Specimen. MVZ 4224.
Range. From Cook Inlet Alaska along the coastal mainland of British Columbia to Dean Inlet. It is known also from a number of islands off the mainland coast: Aristazabel, Banks, Calvert, Campbell, Campania, Hunter, McCauley, Porcher, Princess Royal and Swindle.

Castor canadensis canadensis

Original Description. Kuhl 1820: Beitrage z. Zoologie:64.
Type Locality. Hudson Bay.
Type Specimen. Not known to exist.
Range. Across Canada from western Quebec to the Northwest Territories, Alberta and northeastern British Columbia.

Castor canadensis leucodontus

Original Description. Gray 1869: Ann. and Mag. Nat. Hist. ser. 4(4):293.
Type Locality. Vancouver Island, British Columbia.
Type Specimen. None designated.
Range. Washington, Oregon, northern Idaho and British Columbia where it occupies the southern interior, southwestern coastal mainland as far north as Rivers Inlet, Vancouver Island and larger islands off the west coast of Vancouver Island (Effingham, Fry, Tzartus and Union).
Remarks. Beavers from Vancouver Island were introduced to the Queen Charlotte Islands in 1950. However, differentiation in this introduced population has not been studied.

Castor canadensis sagittatus

Original Description. Benson 1933: J. Mamm. 14:320.
Type Locality. Indianpoint Creek, 3,200 ft. (976 m), 16 mi. NE of Barkerville, British Columbia.
Type Specimen. MVZ 43906.
Range. The southeastern Yukon Territory and the northern and central interior of the province as far south as Kamloops and Glacier.

Family Cricetidae — Cricetids

Genus *Neotoma*

There are nine species in North America; one is found in British Columbia. The genus was revised by Goldman (1910).

Neotoma cinerea (Ord, 1815)

Bushy-tailed Woodrat

A western mammal, *N. cinerea* ranges from the southwestern United States to the southern Yukon Territory and the Northwest Territories. In British Columbia it occurs throughout the entire mainland.

SYNONYMS. *Mus cinereus*, *Myoxus drumondii*, *Neotoma occidentalis*, *Neotoma saxamans*.

OTHER COMMON NAMES. Pack Rat.

SUBSPECIES. Thirteen subspecies are recognized (Hall 1981); three are found in the province.

Neotoma cinerea cinerea

Original Description. Ord 1815: Guthrie's Geog. 2nd Amer. ed. 2:292
Type Locality. Near Great Falls, Cascade Co., Montana.
Type Specimen. Not known to exist.
Range. Montana, Idaho, Wyoming, Alberta and British Columbia where it is known from the extreme southeast (Newgate-Akamina Pass).

Neotoma cinerea drummondii

Original Description. Richardson 1828: J. Zool. 3:517.
Type Locality. Probably near Jasper House, Alberta.
Type Specimen. BMNH 42.10.7.6.
Range. Alberta, British Columbia, the Yukon Territory and the Northwest Territories. It ranges across the eastern part of the province from the Kootenays to the Yukon border.

Neotoma cinerea occidentalis

Original Description. Baird 1855: Proc. Acad. Nat. Sci. Phil. 7:335.
Type Locality. Shoalwater (= Willapa Bay), Pacific Co., Washington.
Type Specimen. USNM 572.
Range. Oregon, Washington, British Columbia, the Yukon Territory and the Northwest Territories. It is distributed throughout the entire central and western mainland.
Remarks. Although Goldman (1910) listed the subspecies *N. c. saxamans* as occurring in the province, Cowan and Guiguet (1965) and Youngman (1975) considered *N. c. saxamans* indistinguishable from *N. c. occidentalis*.

Genus *Peromyscus*

Peromyscus is one of the most widespread and geographically variable small mammals in North America. Its taxonomy is complex and a large number of geographic races, species and species groups are included in the genus. Excellent taxonomic overviews are contained in the classic monograph by Osgood (1909) and in Hooper (1968).

All *Peromyscus* in British Columbia are members of the *maniculatus* group. They have been classified into one or more species and a bewildering number of subspecies. The taxonomic relationships of *Peromyscus* in the province have been complicated by several systematic problems: 1) Relationships between the long-tailed phenotypes of the coastal mountains (i.e., *oreas*) and the short-tailed phenotypes of the coastal and interior mainland (i.e., *artemisiae*, *austerus*, *macrorhinus*) have been controversial. The two phenotypes have been regarded as either distinct species (e.g., Sheppe 1961) or extremes in a chain of intergrading forms (e.g., Hooper 1968); 2) *Peromyscus* inhabits numerous coastal islands in British Columbia. Many of these insular populations are strongly differentiated from mainland populations; moreover, there is much size and colour variation among insular populations. There has been considerable disagreement on the taxonomic status of these island forms and two competing hypotheses evolved. One (e.g., Thomas 1971) is that these island populations represent two separate species: a large species (*P. sitkensis*) and a small species (*P. maniculatus*). The alternate hypothesis is that there is no supporting evidence for the existence of two groups among the island populations, and the various insular forms are best treated as island variants of a single species *P. maniculatus* (e.g., Foster 1965; Cowan and Guiguet 1965).

Recent studies (Gunn and Greenbaum 1986; Allard *et al.* 1987; Allard and Greenbaum 1988; Gunn 1988, Sullivan *et al.* in press) utilizing both chromosomal and morphological data have largely resolved the taxonomy of *Peromyscus* populations on the southern coast. Results from these studies indicate that there are two species in southwestern British Columbia: the Deer Mouse (*P. maniculatus*) and the Columbian Mouse (*P. oreas*). *P. oreas*, a large, long-tailed species, inhabits the coastal mountains, Vancouver Island and islands in Queen Charlotte Strait. *P. maniculatus*, a smaller, short-tailed species, inhabits the coastal and interior mainland, Vancouver Island, and islands in Johnstone Strait and the Strait of Georgia. The two species coexist at some localities on the mainland, on parts of Vancouver Island and on some islands in Queen Charlotte Strait. As yet, there have been no comparable studies on *Peromyscus* from the northern coast or the Queen Charlotte Islands. Therefore the taxonomic status of *Peromyscus* from the northern coast including the Sitka Mouse (*P. sitkensis*), a large species that inhabits the Queen Charlotte Islands and Alexander Archipelago in Alaska, is unclear. However, Allard and Greenbaum (1988) and Gunn (1988) recommended that, based on existing data, *P. sitkensis* should be treated as a distinct species.

Peromyscus maniculatus (Wagner, 1845)

Deer Mouse

P. maniculatus is found across North America. Its taxonomy is more complex and controversial than any other British Columbia mammal. Its vast range throughout the entire mainland as well as many coastal islands has contributed to extensive morphological and genetic variation. There has been no overall taxonomic revision since W.H. Osgood's major revision of the genus in 1909 (Osgood 1909). However, there are many important publications relevant to British Columbia populations, including McCabe and Cowan (1945), Guiguet (1955), Cowan and Guiguet (1965), Hooper (1968), Thomas (1971, 1973), Melton (1982), Gunn and Greenbaum (1986), Allard and Greenbaum (1988), Gunn (1988) and Sullivan *et al.* (1990).

Relationships between *P. maniculatus*, *P. oreas* and *P. sitkensis* are discussed under their species accounts.

SYNONYMS. *Hesperomys austerus*, *Peromyscus maniculatus angustus*, *Peromyscus maniculatus balaclavae*, *Peromyscus maniculatus georgiensis*, *Peromyscus maniculatus saturatus*, *Peromyscus texanus*, *Sitomys americanus*, *Sitomys americanus artemisiae*, *Sitomys keenii*, *Sitomys macrorhinus*.

OTHER COMMON NAMES. White-footed Mouse.

SUBSPECIES. Traditionally (e.g. Cowan and Guiguet 1965; Hall 1981), some 24 or 25 subspecies were recognized in the province. However, Allard and Greenbaum (1988) proposed major changes to the taxonomy of *Peromyscus*. According to Allard and Greenbaum (1988), some of the island races of *P. maniculatus* from the southern coast are actually insular representatives of *P. oreas*; moreover, they considered all *maniculatus* populations from the southern coast as a single race *austerus*. Comparable studies are needed on northern coast populations. Although these populations are currently classified as races of *P. maniculatus* (i.e., *cancrivorous*, *keenii*, *macrorhinus*, *maritimus*, *pluvialis*, *rubriventer*), their tail lengths fall within the range described by Allard and Greenbaum (1988) for *P. oreas*.

Peromyscus maniculatus algidus

Original Description. Osgood 1909: N. Amer. Fauna 28:56.
Type Locality. Head of Bennett Lake, British Columbia.
Type Specimen. USNM 130013.
Range. Alaska, the Yukon Territory and the extreme northwestern corner of the province.

Peromyscus maniculatus alpinus

Original Description. Cowan 1937: Proc. Biol. Soc. Wash. 50:215.
Type Locality. Mount Revelstoke, 6,000 ft. (1,830 m), 19 mi. (31 km) NE of Revelstoke, British Columbia.
Type Specimen. RBCM 2266.
Range. Restricted to the Selkirk Mountains of British Columbia.

Peromyscus maniculatus artemisiae

Original Description. Rhoads 1894: Proc. Acad. Nat. Acad. Sci. Phil. 46:260.
Type Locality. Ashcroft, British Columbia.
Type Specimen. ANSP 7368.
Range. Oregon, Washington, Idaho, Montana, Wyoming and the south-central part of the province as far north as Prince George.

Peromyscus maniculatus austerus

Original Description. Baird 1855: Proc. Acad. Nat. Sci. Phil. 7:336.
Type Locality. Old Fort Steilacoom, Pierce Co., Washington.
Type Specimen. USNM 1278/364.
Range. Washington and the southwestern coast of British Columbia where it inhabits the coastal mainland as far north as Rivers Inlet; Vancouver Island; Malcom, Balaklava, Hope and Vansittart islands in Queen Charlotte Strait; and islands in Johnstone Strait and the Strait of Georgia. Specimens from various islands off the west coast of Vancouver Island have never been formally assigned to a subspecies and they may represent additional populations of *P. maniculatus austerus*.
Remarks. According to Allard and Greenbaum (1988), populations previously described as *P. maniculatus angustus*, *P. maniculatus balaclavae*, *P. maniculatus georgiensis* and *P. maniculatus saturatus* are *P. maniculatus austerus*.

Peromyscus maniculatus borealis

Original Description. Mearns 1890: Bull. Amer. Mus. Nat. Hist. 2:285.
Type Locality. Fort Simpson, Northwest Territories.
Type Specimen. MCZ 5555 (formerly USNM 4531).
Range. The Yukon Territory, the Northwest Territories, Alberta and the central and northern part of the province east of the Coast Mountains.

Peromyscus maniculatus cancrivorous

Original Description. McCabe and Cowan 1945: Trans. Roy. Can. Inst. 25 (2):195.
Type Locality. Table Island, British Columbia.
Type Specimen. RBCM 2060.
Range. An insular race restricted to Table Island.

Peromyscus maniculatus keenii

Original Description. Rhoads 1894: Proc. Acad. Nat. Sci. Phil. 46:258.
Type Locality. Massett, Graham Island, Queen Charlotte Islands, British Columbia.
Type Specimen. ANSP 7768.
Range. An insular race restricted to the larger Queen Charlotte Islands; absent from smaller isolated islands where it is replaced by *P. sitkensis*.

Peromyscus maniculatus macrorhinus

Original Description. Rhoads 1894: Proc. Acad. Nat. Sci. Phil. 46:259.
Type Locality. Mouth of the Skeena River, British Columbia.
Type Specimen. ANSP 8381.
Range. Mainland coast and some adjacent islands of southern Alaska and northwestern British Columbia from Rivers Inlet to Wrangell Island.

Peromyscus maniculatus maritimus

Original Description. McCabe and Cowan 1945: Trans. Roy. Can. Inst. 25 (2):199.
Type Locality. Largest of the Moore Islands, British Columbia.
Type Specimen. RBCM 3010.
Range. An insular race restricted to the Moore Islands.

Peromyscus maniculatus pluvialis

Original Description. McCabe and Cowan 1945: Trans. Roy. Can. Inst. 25 (2):199.
Type Locality. Northern island of the Goose Islands, British Columbia.
Type Specimen. RBCM 3910.
Range. An insular race restricted to the Goose Islands.

Peromyscus maniculatus rubriventer

Original Description. McCabe and Cowan 1945: Trans. Roy. Can. Inst. 25 (2):196.
Type Locality. Ruth Island, near Hunter Island, British Columbia.
Type Specimen. RBCM 3888.
Range. An insular race restricted to Reginald, Smythe, Townsend, Horsfall, Dufferin, Campbell, Hecate, Chatfield and Hunter islands.

Peromyscus oreas Bangs, 1898

Columbian Mouse

P. oreas occupies the coastal mountain ranges from Washington to Rivers Inlet on the British Columbia mainland, Vancouver Island, and adjacent islands off the north and northeast coasts of Vancouver Island. Taxonomy of this long-tailed morph of *Peromyscus* has been controversial. Osgood (1909), Hooper (1968) and Honacki *et al.* (1982) treated it as a race of *P. maniculatus*; but Sheppe (1961) and Cowan and Guiguet (1965) considered it a distinct species. From recent studies (Gunn and Greenbaum 1986; Allard *et al.* 1987; Allard and Greenbaum 1988; Gunn 1988), it is evident that *oreas* is a separate species that can be distinguished from *P. maniculatus* by its larger size and chromosomal differences. Sheppe (1961) only studied populations from the mainland. Allard and Greenbaum (1988) and Gunn (1988) demonstrated that populations on Vancouver Island and islands in Queen Charlotte Strait off the northeast coast of Vancouver Island also represent *P. oreas*. Originally, these populations were considered to be *P. maniculatus* (e.g., McCabe and Cowan 1945; Cowan and Guiguet 1965). It was first demonstrated by Thomas (1971, 1973) that populations from some of the islands in Queen Charlotte Strait (Doyle, Hurst, Nigei) and the Scott Islands off the northern coast of Vancouver Island differ from *P. maniculatus* in chromosome structure and morphology. He classified these populations as *P. sitkensis*. Subsequently, Allard and Greenbaum (1988) and Gunn (1988) demonstrated that populations from Balaklava, Duncan, Heard, Hurst, Malcom and Nigei islands in Queen Charlotte Strait and from parts of Vancouver Island differ from *P. maniculatus* in size and chromosomes. They classified these various populations as insular races of *P. oreas*. Although Allard and Greenbaum (1988) and Gunn (1988) did not include the Scott Islands in their analyses, chromosomal and morphological data given by Thomas (1971, 1973) indicate that these populations are also *P. oreas*.

Chromosomal studies on populations from the northern coast and the Queen Charlotte Islands are needed to resolve the taxonomy of *P. oreas*. Most of these northern coastal populations have been classified as races of *P. maniculatus*. However, their tail lengths are similar to those described by Allard and Greenbaum (1988) for *P. oreas*, suggesting that they may be *P. oreas* or *P. sitkensis*.

SYNONYMS. *Peromyscus maniculatus beresfordi*, *Peromyscus maniculatus carli*, *Peromyscus maniculatus doylei*, *Peromyscus maniculatus interdictus*, *Peromyscus maniculatus oreas*, *Peromyscus maniculatus sartinensis*, *Peromyscus maniculatus saxamans*, *Peromyscus sitkensis doylei*, *Peromyscus sitkensis isolatus*, *Peromyscus sitkensis saxamans*.

OTHER COMMON NAMES. Cascade Deer Mouse.

SUBSPECIES. Allard and Greenbaum (1988) proposed three subspecies; all occur in the province.

Peromyscus oreas interdictus

Original Description. Anderson 1932: Ann. Rept. Nat. Mus. Canada 1931:110.
Type Locality. Forbidden Plateau, N of Mount Albert Edward, 4,200 ft. (1,281 m), Vancouver Island, British Columbia.
Type Specimen. NMC 11432.

Range. An insular race inhabiting western and northern Vancouver Island. This taxon evidently coexists with *P. maniculatus austerus* at some localities on Vancouver Island. Specimens from various islands off the west coast of Vancouver Island have never been described or formally assigned to a subspecies; some may represent additional populations of *P. oreas interdictus*.

Remarks. This taxon was previously considered a race of *P. maniculatus* (i.e., *P. maniculatus interdictus*).

Peromyscus oreas isolatus

Original Description. Cowan 1935: Univ. Calif. Publ. Zool. 40:434.

Type Locality. Pine Island, British Columbia.

Type Specimen. NMC 34514.

Range. An insular subspecies restricted to islands in Queen Charlotte Strait (Balaklava, Bell, Doyle, Duncan, Heard, Hurst, Malcom, Nigei, Pine) and the Scott Islands (Beresford, Cox, Lanz, Sartine, Triangle). *P. oreas isolatus* coexists with *P. maniculatus austerus* on Balaklava and Malcom islands.

Remarks. This taxon has had a complicated taxonomic history. It was originally described by Cowan (1935) as a race of *P. sitkensis* (*P. sitkensis isolatus*) restricted to Pine Island. McCabe and Cowan (1945) and Cowan and Guiguet (1965) reclassified it as a subspecies of *P. maniculatus* (*P. maniculatus isolatus*) that occurs on Pine and Nigei islands. Thomas (1971, 1973) considered *isolatus* a subspecies of *P. sitkensis*. He also assigned the various Scott Island populations to this race. Allard and Greenbaum (1988) proposed that *isolatus* was a race of *P. oreas*. From the studies of Thomas (1971, 1973), Allard and Greenbaum (1988) and Gunn (1988), it is evident that *P. oreas isolatus* includes populations from the Scott Islands and various insular populations in Queen Charlotte Strait.

Peromyscus oreas oreas

Original Description. Bangs 1898: Proc. Biol. Soc. Wash. 12:84.

Type Locality. Mount Baker Range, 6,500 ft. (1,983 m), British Columbia, near boundary of Whatcom Co., Washington.

Type Specimen. MCZ B3696.

Range. Coastal mountain ranges of southern British Columbia and Washington. According to Gunn and Greenbaum (1986), it coexists with *P. maniculatus austerus* at some localities on the Olympic Peninsula of Washington.

Remarks. Osgood (1909), Hooper (1968) and Honacki *et al.* (1982) treat this taxon as a subspecies of *maniculatus* (*P. maniculatus oreas*).

Peromyscus sitkensis Merriam, 1897

Sitka Mouse

The taxonomic status of *P. sitkensis* is unclear. In his revision, Osgood (1909) described *sitkensis* as a species restricted to Baranof and Chicagof islands in the Alexander Archipelago of Alaska and Prevost Island (= Kunghit Island) in the Queen Charlotte Islands of British Columbia. Based on additional material, Swarth (1911) extended the range of *P. sitkensis* to more of the Alexander Islands in Alaska (Coronation, Warren, Forrester and Duke islands). In his revision of *P. sitkensis*, Cowan (1935) recognized four subspecies for the species and extended the range to include more of the Alexander Islands in Alaska and Pine Island north of Vancouver Island. In later studies, however, McCabe and Cowan (1945) questioned the distinctness of *P. sitkensis*. From a morphometric study of *Peromyscus* from the Queen Charlotte Islands, Foster (1965), concluded that *sitkensis* and *maniculatus* were conspecific. Presumably based on the conclusions of Foster (1965), Cowan and Guiguet (1965) treated all *P. sitkensis* from British Columbia as subspecies of *P. maniculatus*. Hall (1981) assigned all of the insular *Peromyscus* in the province to *P. maniculatus* and restricted *P. sitkensis* to some of the outer islands of the Alexander Archipelago in Alaska. From a modern study applying chromosomal and morphological data, Thomas (1971, 1973) concluded that populations from the Scott Islands and islands in Queen Charlotte Strait off Vancouver Island were *P. sitkensis*. Allard and Greenbaum (1988), however, demonstrated that the populations

classified as *P. sitkensis* by Thomas (1971), as well as some Vancouver Island populations, represent *P. oreas*. The only other population of *P. sitkensis* to be studied by modern methods is the Baranof Island population in Alaska. Chromosomal data (Gunn and Greenbaum 1986; Gunn 1988) and morphological data (Allard and Greenbaum 1988) suggest that it is distinct from *P. maniculatus* but similar to *P. oreas*. Chromosomal and morphological studies on intervening *Peromyscus* populations from the northern coast of British Columbia are essential to determine if *P. sitkensis* and *P. oreas* represent separate species or geographic variants of a single species. Until such studies are done, it is best to regard *sitkensis* as a separate species restricted to the Queen Charlotte Islands and Alexander Archipelago.

SYNONYMS. *Peromyscus maniculatus sitkensis*, *Peromyscus prevostensis*.

OTHER COMMON NAMES. None.

SUBSPECIES. There has been no modern study of subspecies in this species. In his revision, Cowan (1935) described four subspecies with two (*isolatus* and *prevostensis*) found in the province; *isolatus* is now considered a race of *P. oreas* (Allard and Greenbaum 1988).

Peromyscus sitkensis prevostensis

Original Description. Osgood 1901: N. Amer. Fauna 21:29.
Type Locality. Prevost (= Kunghit) Island, Queen Charlotte Islands, British Columbia.
Type Specimen. USNM 100818.
Range. An insular race restricted to the small, isolated outer islands of the Queen Charlotte Islands.
Remarks. Originally described as *P. sitkensis prevostensis* by Osgood (1901) and Cowan (1935); Cowan and Guiguet (1965) classified this taxon as *P. maniculatus sitkensis*.

Genus *Reithrodontomys*

There are 19 species in North and Middle America; 1 is found in the province. The only taxonomic revision of the North American species was by Howell (1914).

Reithrodontomys megalotis (Baird, 1858)

Western Harvest Mouse

R. megalotis has an extensive range throughout western and central North America and Mexico. In Canada, however, where it is at the northern periphery of its range, it is restricted to southern British Columbia and southeastern Alberta.

SYNONYMS. *Reithrodon megalotis*

OTHER COMMON NAMES. None.

SUBSPECIES. Jones and Mursaloğlu (1961) reviewed geographic variation in the central Great Plains, but there has been no comprehensive study throughout the entire range and a modern revision is needed. Hall (1981) listed 13 subspecies in North America; 1 is found in the province.

Reithrodontomys megalotis megalotis

Original Description. Baird 1858: Repts. Expl. Surv. 8(1):451.
Type Locality. Between Janos, Chihuahua and San Luis Springs, Grant Co., New Mexico.
Type Specimen. USNM 2281.
Range. The western United States, Mexico, Alberta and British Columbia where it is known only from the Okanagan Valley.

Family Erethizontidae — New World Porcupines

Genus *Erethizon*

There is one species in the genus.

Erethizon dorsatum (Linnaeus, 1758)

Porcupine

Broadly distributed across the North American continent, *E. dorsatum* occupies the entire mainland of the province.

SYNONYMS. *Erethizon epixanthus*, *Erethizon epixanthus myops*, *Erethizon epixanthus nigrescens*.

OTHER COMMON NAMES. None.

SUBSPECIES. Anderson and Rand (1943) assessed geographic variation and subspecies in Canada; however, there has been no modern study of geographic variation. Hall (1981) listed six races for North America (Hall 1981); two occur in the province.

Erethizon dorsatum myops

Original Description. Merriam 1900: Proc. Wash. Acad. Sci. 2:27.
Type Locality. Portage Bay, Alaska Peninsula, Alaska.
Type Specimen. USNM 59140.
Range. Alaska, the Yukon Territory, the western Northwestern Territories, northwestern Alberta, and extreme northern and northeastern British Columbia.

Erethizon dorsatum nigrescens

Original Description. Allen 1903. Bull. Amer. Mus. Nat. Hist. 19:558.
Type Locality. Shesley River, British Columbia.
Type Specimen. AMNH 20772.
Range. Washington, northern Idaho, northwestern Montana, southwestern Alberta, and the entire north-central and southern mainland of British Columbia.

Family Geomyidae — Pocket Gophers

Genus *Thomomys*

The systematics of this North American genus is complex, and several widespread species demonstrate enormous genetic and phenotypic variation. There is still disagreement on the number of valid species in the genus. Bailey (1915) recognized 40 species in his revision; Hall (1981) reduced the number of species to 5. Honacki *et al.* (1982) listed 9 species in *Thomomys*, but chromosomal studies by Thaeler (1985) suggest that this may be simplistic. One species occurs in the province.

Thomomys talpoides (Richardson, 1828)

Northern Pocket Gopher

This pocket gopher is distributed throughout the Great Plains and western Cordillera of North America. In British Columbia it inhabits the southern dry interior, southern Kootenays and southern Rocky Mountains. Colour and morphometric variation among populations is extensive and this has led to the description of some 58 subspecies. Thaeler (1985), who studied chromosome variation across the United States, concluded that the *T. talpoides* complex consisted of 38 chromosomal races that represent 11 distinct species. Some of these chromosomal races can be distinguished by morphology but others are inseparable morphologically (i.e., sibling species). Chromosomes have not been analysed in British Columbia populations of *T. talpoides*, but the map in Thaeler (1985) suggests that two or three species may be present in the province.

SYNONYMS. *Thomomys clusius*, *Thomomys fuscus*, *Thomomys myops*.

OTHER COMMON NAMES. None.

SUBSPECIES. Hall (1981) listed 58 subspecies for North America. Geographic variation and subspecies among British Columbia populations were studied by Johnstone (1954) who recognized six races in the province based on traditional pelage and skull characters. These traits are notoriously variable in *Thomomys* and to some extent may be modified by direct environmental effects (Smith and Patton 1980). Given the incongruence with morphological and genetic traits and the existence of sibling species in the *Thomomys* complex, it is doubtful that the races proposed by Johnstone (1954) are a realistic representation of taxonomic diversity in British Columbia's *T. talpoides*. Detailed chromosomal and biochemical studies are required to resolve the taxonomy of *Thomomys* in the province.

Thomomys talpoides cognatus

Original Description. Johnstone 1954. Can. Field-Nat. 68:163.
Type Locality. Crowsnest Pass, British Columbia.
Type Specimen. RBCM 5827.
Range. Extreme southeastern British Columbia from the Crowsnest Pass to the Montana border and as far west as the Kootenay River.

Thomomys talpoides fuscus

Original Description. Merriam 1891: N. Amer. Fauna 5:69.
Type Locality. Montana at head of Big Lost River, Custer Co., Idaho.
Type Specimen. USNM 24267/31671.
Range. Idaho, northern Washington and the southern Monashee Mountains of British Columbia.

Thomomys talpoides incensus

Original Description. Goldman 1939: J. Mamm. 20:240.
Type Locality. Shuswap, British Columbia.
Type Specimen. USNM 67096.
Range. The southern dry interior of the province from the Thompson River valley to the Washington border. The eastern limit is the Monashee Mountains; the western limit is the eastern slopes of the Cascade Mountains.

Thomomys talpoides medius

Original Description. Goldman 1934: J. Mamm. 20:241.
Type Locality. Silver King mine, summit of Toad Mountain, 6 mi. (9.7 km) S of Nelson, British Columbia.
Type Specimen. USNM 66653.
Range. Restricted to the Southern Kootenays in the province where the Kootenay River, Kootenay Lake and Columbia River delimit its range. It may also occur in extreme northern Idaho.

Thomomys talpoides saturatus

Original Description. Bailey 1914: Proc. Biol. Soc. Wash. 27:117.
Type Locality. Silver, near Saltese, 4,300 ft. (1,312 m), Coeur d'Alene Mountains, Missoula Co. (= Mineral Co.), Montana.
Type Specimen. USNM 28781/40885.
Range. Northeastern Idaho, northwestern Montana and the southern Kootenays in British Columbia.

Thomomys talpoides segregatus

Original Description. Johnstone 1954: Can. Field-Nat. 68:161.
Type Locality. Goat Mountain, near Wynndel, British Columbia.
Type Specimen. RBCM 5825.
Range. An isolated race restricted to the Wynndel-Creston region.

Family Heteromyidae — Heteromyids

Genus *Perognathus*

This North American genus was revised by Osgood (1900); there are 25 species with 1 found in the province.

Perognathus parvus (Peale, 1848)

Great Basin Pocket Mouse

This mouse is associated with the arid intermontane regions of the United States from California and northern New Mexico to Washington. In Canada, where it is at the northern periphery of its range, it is restricted to the southern dry interior of British Columbia.

SYNONYMS. *Abromys lordi*, *Perognathus laingi*, *Perognathus lordi*.

OTHER COMMON NAMES. None.

SUBSPECIES. Hall (1981) recognized 11 races, but the species is in need of a revision. According to Cowan and Guiguet (1965) and Hall (1981), two subspecies representing high and low altitude populations occur in the province. Nonetheless, a comprehensive study of geographic variation is required to verify the existence of two distinct morphs in British Columbia. Although Iverson (1967) reported cranial differences among the low and high altitude populations, he noted that the overall pattern of variation among populations is a "checkerboard".

Perognathus parvus laingi

Original Description. Anderson 1932: Bull. Nat. Mus. Canada 70:100.
Type Locality. Anarchist Mountain, near Osoyoos-Bridesville summit, 3,500 ft. (1,068 m), British Columbia.
Type Specimen. NMC 9200.
Range. Restricted to the province, where it is known from Ashcroft to Kamloops in the Thompson River Valley and from Vernon, Okanagan Landing and Anarchist Mountain in the Okanagan Valley.

Perognathus parvus lordi

Original Description. Gray 1868: Proc. Zool. Soc. London: 202.
Type Locality. Southern British Columbia.
Type Specimen. None designated.
Range. Northern Washington, northwestern Idaho and British Columbia where it occupies lower elevations in the Okanagan, Similkameen and Kettle River valleys.
Remarks. Iverson's (1967) conclusion that "no differences large enough to suggest the existence of two subspecies were found among the Osoyoos, Anarchist and Vernon populations" suggests that the validity of *laingi* is questionable.

Family Muridae — Murids

Genus *Mus*

Species of the genus are native to Europe, Asia and Africa. There is disagreement among taxonomists on the limits of the genus and the number of species. Honacki *et al.* (1982) listed 40 species; 1 has been introduced to the new world: *Mus musculus*.

Mus musculus Linnaeus, 1776

House Mouse

M. musculus was originally restricted to Eurasia; however, various commensal forms associated with man have been transported to all the continents and numerous islands. The house mouse also has been domesticated for laboratory research. Genetic and phenotypic variation is extensive

and there are a number of distinct "wild" and "commensal" forms. Systematics is complicated by the coexistence of different forms in some areas. Schwarz and Schwarz (1943) revised the taxonomy; some of the subspecies described by Schwarz and Schwarz (1943) were considered full species by Marshall and Sage (1981).

SYNONYMS. *Mus domesticus*.

OTHER COMMON NAMES. None.

SUBSPECIES. According to Schwarz and Schwarz (1943), populations in Canada were derived from the commensal race *Mus musculus domesticus*. Differentiation among the North American populations has not been studied.

Mus musculus domesticus

Original Description. Rutty 1772: Essay Nat. Hist. County Dublin 1:281.
Type Locality. Dublin, Ireland.
Type Specimen. Not known to exist.
Range. Europe and introduced to North America. In British Columbia it inhabits urban and agricultural areas throughout the entire mainland. There are specimen records from Vancouver Island and the Gulf Islands. *M. musculus* may occur on other islands, although it evidently is absent from islands off the northern coast and the Queen Charlotte Islands.
Remarks. Marshall and Sage (1981) considered this race a distinct species *Mus domesticus*.

Genus *Rattus*

The systematics of this Old World genus is extremely complex and there is disagreement on number of species. Honacki *et al.* (1982) listed 63 species; 2 were introduced to the New World.

Rattus norvegicus (Berkenhout, 1769)

Norway Rat

Berkenhout, 1769. Outlines Nat. Hist. Great Britain and Ireland, 1:5 (N.V.). Type Locality, Great Britain. Type Specimen, none designated.

This Old World species originally inhabited Asia. It has been widely introduced throughout the world including North America. In British Columbia it is associated with urban and agricultural areas in the southern mainland; but, according to Cowan and Guiguet (1965), it is absent from the northern interior and Peace River area. Its precise insular distribution in the province has not been studied. There are specimens from Vancouver Island, various islands off the west coast of Vancouver Island (Guiguet 1974) and Cape St. James in the Queen Charlotte Islands.

SYNONYMS. *Mus norvegicus*.

OTHER COMMON NAMES. None.

SUBSPECIES. Several races have been described in the Old World, but the taxonomy of North American populations is obscured by multiple introductions.

Rattus rattus (Linnaeus, 1758)

Black Rat

Linnaeus, 1758. Syst. Nat. 10,1:61. Type Locality, Uppsala, Sweden. Type Specimen, none designated.

Originally a species of India and southern Asia, *R. rattus* has been introduced throughout the world. In British Columbia it occupies the southwest coast, Vancouver Island and many of the Queen Charlotte Islands. This species demonstrates an enormous range of colour, morphometric and genetic variation. As in *M. musculus* there are distinct "wild" and "commensal" forms; moreover, interbreeding populations may be polymorphic. Schwarz and Schwarz (1965) revised the taxonomy, but their revision has not been widely accepted.

SYNONYMS. *Mus rattus*.

OTHER COMMON NAMES. Roof Rat.

SUBSPECIES. Schwarz and Schwarz (1965) adopted the traditional view that three subspecies of black rats from the Old World were introduced to North America (*R. rattus rattus*, *R. rattus alexandrinus*, *R. rattus frugivorous*); they are distinguished by colour. Although Cowan and Guiguet (1965) reported that the races *alexandrinus* and *rattus* are present in the province, Caslick (1956) and Corbet (1978) concluded that the three colour forms are simply colour phases and they should not be recognized as subspecies. It is evident that several colour morphs coexist at some localities in the province.

Myocastoridae — Myocastorids

Genus *Myocastor*

There is one species in the genus.

Myocastor coypus (Molina, 1782)

Nutria

Molina, 1782. Sagg. Stor. Nat. Chile p. 287. Type Locality, Rio Maipo, Chile. Type Specimen, none designated.

M. coypus is native to South America; however, through deliberate releases or escapes from fur farms there are feral populations in various parts of North America. According to Carl and Guiguet (1972), it was first brought to the province in the late 1930s. Wild animals have been reported from the lower mainland and from Saltspring and Vancouver islands, but there are no large feral populations. Present status of this species in the province is unknown.

SYNONYMS. *Myopotamus bonariensis*.

OTHER COMMON NAMES. Coypu.

SUBSPECIES. Hall (1981) reported that the race introduced to North America was *M. coypus bonariensis*. However, the application of a subspecies name is probably inappropriate for an introduced mammal derived from multiple introductions and captive stocks.

Family Sciuridae — Squirrels

Genus *Glaucomys*

There are two species in the genus; one occurs in the province. Howell (1918) revised the genus.

Glaucomy sabrinus (Shaw, 1801)

Northern Flying Squirrel

This squirrel is broadly distributed across Alaska, Canada and boreal-montane habitats in the conterminous United States. It occupies the entire mainland of the province and several coastal islands.

SYNONYMS. *Pteromys alpinus*, *Pteromys oregonensis*, *Sciuropterus alpinus fulginosus*, *Sciuropterus alpinus zaphaeus*.

OTHER COMMON NAMES. None.

SUBSPECIES. There has been no overall revision of this species since the study by Howell (1918). Hall (1981) listed 25 subspecies; 7 occur in the province.

Glaucomys sabrinus alpinus

Original Description. Richardson 1828: Zool. Journ. 3:519.
Type Locality. Jasper House, Alberta.
Type Specimen. Not known to exist.
Range. Western Alberta, the southern Yukon Territory, and most of northern and central British Columbia.
Remarks. Youngman (1975) could not distinguish *G. s. alpinus* from *G. s. sabrinus* and classified all Yukon material as *G. s. sabrinus*.

Glaucomys sabrinus columbiensis

Original Description. Howell 1915: Proc. Biol. Soc. Wash. 28:111.
Type Locality. Okanagan, British Columbia.
Type Specimen. USNM 94310.
Range. Extreme northern Washington and the southern dry interior (Okanagan, Nicola, Similkameen valleys) of the province.

Glaucomys sabrinus fuliginosus

Original Description. Rhoads 1897: Proc. Acad. Nat. Sci. Phil. 49:321.
Type Locality. Cascade Mountains, near Martin Station, 8,000 ft. (2,440 m), Kittitas Co., Washington.
Type Specimen. ANSP 8058.
Range. From the Cascade Mountains of Oregon and Washington to the southern Coast Mountains in British Columbia.

Glaucomys sabrinus laticeps

Original Description. Howell 1915: Proc. Biol. Soc. Wash. 28:12.
Type Locality. Glacier, British Columbia.
Type Specimen. USNM 68753.
Range. Southeastern Alberta, northwestern Montana, northern Idaho, northeastern Washington, and the Selkirk, Purcell and southern Rocky mountain ranges in British Columbia as far north as Glacier.

Glaucomys sabrinus oregonensis

Original Description. Bachman 1839: J. Acad. Nat. Sci. Phil. 8:101.
Type Locality. Probably near St. Helen, Columbia Co., Oregon.
Type Specimen. ANSP 253.
Range. From the coastal lowlands of Oregon to Loughborough Inlet of coastal British Columbia where it has also been recorded from Quadra and Cortez islands.

Glaucomys sabrinus reductus

Original Description. Cowan 1937: Proc. Biol. Soc. Wash. 50:79.
Type Locality. Lonesome Lake, Atnarko River, approximately 52°10′N, 125°45′W, British Columbia.
Type Specimen. RBCM 2394.
Range. Restricted to the province where it ranges from the central Coast Mountains as far east as Quesnel.

Glaucomys sabrinus zaphaeus

Original Description. Osgood 1905: Proc. Biol. Soc. Wash. 18: 133.
Type Locality. Helm Bay, Cleveland Peninsula, southeastern Alaska.
Type Specimen. USNM 136137.
Range. Southeastern Alaska and the northwestern coastal region of the province including Princess Royal Island.

Genus *Marmota*

Six species inhabit North America; four are found in the province. General overviews of the genus are given in Howell (1915) and Hoffmann *et al.* (1979).

Marmota caligata (Eschscholtz, 1829)

Hoary Marmot

An inhabitant of alpine areas, *M. caligata* ranges across the western Cordillera from Alaska, the Yukon Territory and the extreme western Northwest Territories to Washington, northern Idaho and northern Montana. In British Columbia it occupies most of the mainland except for the northeast and low elevations in the dry interior.

SYNONYMS. *Arctomys caligatus*, *Arctomys okanaganus*, *Marmota okanagana*, *Marmota oxytona*, *Marmota sibila*.

OTHER COMMON NAMES. Whistler.

SUBSPECIES. Variation in size and pelage colour among populations is substantial. Based on small sample sizes, Howell (1915) described the patterns of geographic variation and revised subspecies. Hoffmann *et al.* (1979) analysed morphometric variation among several subspecies, but there has been no comprehensive study of geographic variation throughout the entire range. Hall (1981) recognized nine subspecies; five are found in the province.

Marmota caligata caligata

Original Description. Eschscholtz 1829: Zool. Atlas Part 2:1.
Type Locality. Near Bristol Bay, Alaska.
Type Specimen. Not known to exist.
Range. Alaska south of Brooks Range, the Yukon Territory, the Mackenzie Valley in the Northwest Territories and extreme northwestern British Columbia from the Haines Triangle to the Stikine River.

Marmota caligata cascadensis

Original Description. Howell 1914: Proc. Biol. Soc. Wash. 27:17.
Type Locality. Mount Rainier, 6,000 ft. (1,830 m), Pierce Co., Washington.
Type Specimen. USNM 90134.
Range. A coastal race that ranges from the Cascade Range of Washington as far north as Garibaldi Provincial Park.

Marmota caligata okanagana

Original Description. King 1836: Narr. Journ. Shores Arctic Ocean Vol. 2: 236.
Type Locality. Probably the Gold Range (= Shuswap Range according to Anderson 1934), British Columbia.
Type Specimen. BMNH 55.12.24.126.
Range. Extreme southwestern Alberta and the Monashee, Selkirk, Purcell and Rocky mountains in southeastern British Columbia.
Remarks. Crowe (1943) assigned specimens from Tornado Pass, Monarch Mountain and Farrow Pass northwest of Mount Assiniboine to the race *nivaria*, but Cowan and Guiguet (1965) classified these populations as *okanagana*.

Marmota caligata oxytona

Original Description. Hollister 1912: Smith Misc. Coll. 56(35):1
Type Locality. Head of Moose Pass, branch of Smoky River, 7,200 ft. (2,196 m), Alberta (near Moose Pass, British Columbia).
Type Specimen. USNM 174503.
Range. The southeastern Yukon Territory, the southwestern Northwest Territories and part of the Rocky Mountains in Alberta. It ranges from the northern interior of the province as far south as Barkerville and Mount Robson.
Remarks. Youngman (1975) considered this race indistinguishable from *M. c. caligata*.

Marmota caligata raceyi

Original Description. Anderson 1932: Nat. Mus. Canada, Ann. Rept. 1931:112.
Type Locality. Itcha Mountains, Chilcotin Plateau, 6,500 ft. (1,983 m), British Columbia.
Type Specimen. NMC 11430.
Range. Restricted to British Columbia where it inhabits mountains in the Chilcotin Plateau and the Coast Mountains as far north as Kitimat and Ootsa Lake.

Marmota flaviventris (Audubon and Bachman, 1841)

Yellow-bellied Marmot

M. flaviventris is found in the western Cordillera from southern British Columbia and Alberta to California, Nevada and New Mexico. In the northern part of its range it is restricted to lower elevations and its distribution overlaps with *M. caligata* only in a small region of western Washington and northwestern Montana.

SYNONYMS. *Arctomys flaviventer*, *Arctomys flaviventer avarus*, *Marmota flaviventer avarus*.

OTHER COMMON NAMES. None.

SUBSPECIES. There has been no analysis of geographic variation or revision of subspecies since the study by Howell (1915). Hall (1981) listed 11 subspecies; 1 occurs in British Columbia.

Marmota flaviventris avara

Original Description. Bangs 1899: Proc. New England Zool. Club 1:68.
Type Locality. Okanagan, British Columbia.
Type Specimen. MCZ B7971.
Range. Nevada, Oregon, Idaho, Washington and British Columbia where it inhabits the dry interior as far north as Williams Lake.

Marmota monax (Linnaeus, 1758)

Woodchuck

Widely distributed across eastern North America and central Canada, *M. monax* is restricted to central Alaska, the southern Yukon Territory and parts of British Columbia. The precise altitudinal distribution of *M. monax* in the province and the extent that its range overlaps those of *M. caligata* and *M. flaviventris* is unknown.

SYNONYMS. *Arctomys monax*, *Marmota ochracea*.

OTHER COMMON NAMES. Groundhog.

SUBSPECIES. Subspecies were last revised by Howell (1915); there has been no recent study applying modern methods. Hall (1981) listed nine subspecies; three occur in the province.

Marmota monax canadensis

Original Description. Erxleben 1777: Syst. Regni. Anim. vol. 1: 363.
Type Locality. Quebec, Quebec.
Type Specimen. None designated.
Range. An extensive distribution across North America from the Maritimes and New England to Alberta, the southern Northwest Territories and the Peace River region of the province.

Marmota monax ochracea

Original Description. Swarth 1911: Univ. Calif. Publ. Zool. 7:203.
Type Locality. Fortymile Creek, Alaska.
Type Specimen. MVZ 5872.
Range. Central Alaska, the southern Yukon Territory, and extreme north-central (Liard River) and northwestern (Haines Triangle to Atlin) British Columbia.
Remarks. Youngman (1975) noted that this is a weakly differentiated race.

Marmota monax petrensis

Original Description. Howell 1915: N. Amer. Fauna 37:33.
Type Locality. Revelstoke, British Columbia.
Type Specimen. USNM 203532.
Range. Northern Idaho, extreme northeastern Washington; in the province it ranges from the Stikine River to the Chilcotin River and Creston in the southeast.

Marmota vancouverensis Swarth, 1911

Vancouver Island Marmot

Swarth, 1911. Univ. California Publ. Zool. 7:201. Type Locality, Mount Douglas (= Douglas Peak), Vancouver Island, British Columbia. Type Specimen, MVZ 12094.

The only mammal species endemic to the province, *M. vancouverensis* is restricted to mountains in southeastern Vancouver Island (Nagorsen 1987).

SYNONYMS. None.

OTHER COMMON NAMES. Vancouver Marmot.

SUBSPECIES. No subspecies are recognized.

Genus *Sciurus*

Eight species occur in North America; two were introduced to British Columbia.

Sciurus carolinensis Gmelin, 1788

Gray Squirrel

Native to eastern Canada and the United States, populations of this squirrel were introduced into several areas in western North America. There have been two separate introductions to the province. The Vancouver population originated from animals introduced to Stanley Park in about 1914 (Robinson and Cowan 1954). Another population, restricted to the Victoria region of Vancouver Island, was introduced in the late 1960s (Guiguet 1975).

SYNONYMS. *Sciurus carolinensis leucotis*, *Sciurus leucotis*, *Sciurus migratorius*.

OTHER COMMON NAMES. None.

SUBSPECIES. Hall (1981) listed five races; both introduced populations in the province are derived from *S. c. pennsylvanicus* obtained in Ontario.

Sciurus carolinensis pennsylvanicus

Original Description. Ord 1815: in Guthrie, A new geogr. hist. coml. grammar. Philadelphia, Amer. ed. 2,2:292.
Type Locality. W of Allegany Ridge, Pennsylvania.
Type Specimen. Not known to exist.
Range. Eastern Canada and the United States.

Sciurus niger Linnaeus, 1758

Fox Squirrel

Linnaeus, 1758. Syst. Nat. 10 1:64. Type Locality, probably South Carolina, United States. Type Specimen, none designated.

S. niger ranges throughout the central and eastern United States; in Canada it is restricted to southern Manitoba and Pelee Island, Ontario. There have been a number of introductions to the western United States. A population that recently appeared in the extreme southern Okanagan Valley around Osoyoos presumably originated from individuals that dispersed from the introduced population in Okanogan County, Washington.

SYNONYMS. *Sciurus cinereus*, *Sciurus ruber*, *Sciurus rufiventer*.

OTHER COMMON NAMES. None.

SUBSPECIES. Origin of this introduced population is obscure and racial affinities of these introduced animals is unknown.

Genus *Spermophilus*

Howell (1938) revised the genus under the name *Citellus*. Robinson and Hoffmann (1975) assessed relationships in several species by multivariate analyses of morphometric data, but there has been no comprehensive review of the entire genus applying modern methods. About 18 species occur in North America; 4 are found in British Columbia.

Spermophilus columbianus (Ord, 1815)

Columbian Ground Squirrel

Associated with the western cordillera of North America, *S. columbianus* ranges from northeastern Oregon and Washington, northern Idaho and northwestern Montana to southeastern British Columbia and the Rocky Mountains of Alberta.

SYNONYMS. *Arctomys columbianus*, *Arctomys parryi* var. *erythrogluteia*, *Citellus columbianus*, *Spermophilus empetra* var. *erythroglutaeus*.

OTHER COMMON NAMES. None.

SUBSPECIES. In his revision, Howell (1938) recognized two subspecies; one occurs in the province. Elliot and Flinders (1984) confirmed the distinctness of the two races in Idaho.

Spermophilus columbianus columbianus

Original Description. Ord 1815: Guthrie's Geography, 2nd Amer. ed., vol. 2: 292.
Type Locality. Camas prairie, between the forks of the Clearwater and Kookooskie, Lincoln Co., Idaho.
Type Specimen. None designated.
Range. Northwestern Montana, the Rocky Mountains of Alberta, northern Idaho, northeastern Oregon and Washington, and British Columbia where it occupies the Rocky, Purcell, Selkirk, Monashee and Cascade mountain ranges, and parts of the dry interior as far west as the Fraser River.

Spermophilus lateralis (Say, 1823)

Golden-mantled Ground Squirrel

This ground squirrel is found throughout the western cordillera from California, New Mexico and Arizona north to western Alberta and eastern British Columbia. Howell (1938) classified the mantled ground squirrels into three allopatric species: golden-mantled ground squirrel (*S. lateralis*), Cascade golden-mantled ground squirrel (*S. saturatus*), and Sierra Madre golden-mantled ground squirrel (*S. madrensis*). Hall (1981) adopted this traditional taxonomy although some authorities (e.g., Banfield 1974) have considered *S. saturatus* to be a subspecies of *S. lateralis*. In an unpublished Ph.D. dissertation, Wright (1972) proposed major changes to the taxonomy of the mantled ground squirrels. Based on pelage and cranial variation he concluded that the mantled ground squirrel populations fall into two distinct phenotypes that should be treated as full species: *S. lateralis* and *S. castanurus*. *S. lateralis*, as defined by Wright (1972), includes *S. saturatus*, *S. madrensis* and southern Rocky Mountain populations of *S. lateralis*; *S. castanurus* comprises northern Rocky Mountain, Great Basin and Pacific State populations assigned by Howell (1938) to *S. lateralis*. Despite Wright's (1972) conclusion of two distinct species, much of the morphometric variation among these populations is clinal. Multivariate analysis of cranial and pelage variation and genetic studies are required to resolve the systematics of this group. Until such studies are done, I recommend that the taxonomy of Howell (1938) be followed.

SYNONYMS. *Callospermophilus lateralis*, *Citellus lateralis*.

OTHER COMMON NAMES. Mantled Ground Squirrel.

SUBSPECIES. Hall (1981) listed 13 subspecies with 1 occuring in the province. *S. lateralis*, as defined by Wright (1972), comprises 3 races.

Spermophilus lateralis tescorum

Original Description. Hollister 1911: Smith. Misc. Coll. 56(26):2.
Type Locality. Head of Moose Pass, Smoky River, 7,000 ft. (2,135 m), Alberta (near Moose Pass, British Columbia).
Type Specimen. USNM 174165.
Range. Idaho, northwestern Montana, the Rocky Mountains in Alberta and British Columbia where it inhabits the Selkirk, Purcell, Cariboo and Rocky mountain ranges as far north as Mount Selwyn.
Remarks. According to Wright's (1972) taxonomy, this taxon is classified as *S. castanurus cinerascens*.

Spermophilus parryii (Richardson, 1825)

Arctic Ground Squirrel

S. parryii has a vast range across northeastern Siberia, Alaska, the Yukon Territory, the Northwest Territories, northern Manitoba and northern British Columbia. Nomenclature and systematics of the arctic ground squirrels have been contentious. North American populations were classified as *Spermophilus undulatus* by a number of taxonomists (e.g., Bee and Hall 1956; Rausch 1953). However, *S. undulatus* is now applied to a species that inhabits southern Siberia, Mongolia and northeastern China; northeastern Siberian and North American populations are considered a separate species: *S. parryii* (Honacki *et al.* 1982).

SYNONYMS. *Citellus parryii*, *Citellus plesius*, *Citellus undulatus*, *Spermophilus empetra plesius*, *Spermophilus undulatus*.

OTHER COMMON NAMES. Parry Ground Squirrel.

SUBSPECIES. Howell (1938) revised subspecies of North American populations. Hall (1981) listed eight North American races; but patterns of genetic (Nadler and Hoffmann 1977) and morphometric (Pearson 1981) variation suggest that there are probably only six valid subspecies in North America. One occurs in the province.

Spermophilus parryii plesius

Original Description. Osgood 1900: N. Amer. Fauna 19:29.
Type Locality. Bennett City, head of Bennett Lake, British Columbia.
Type Specimen. USNM 98931.
Range. Eastern Alaska, the southern Yukon Territory, the western Northwest Territories and northwestern British Columbia as far south as the Spatsizi and Klappan rivers.

Spermophilus saturatus (Rhoads, 1895)

Cascade Mantled Ground Squirrel

Rhoads, 1895. Proc. Acad. Nat. Sci. Phil. p. 43. Type Locality, Lake Keechelus, Kittitas Co., Washington. Type Specimen, ANSP 8365.

S. saturatus is restricted to the Cascade Mountains of Washington and southern British Columbia where the precise northern limits of its range are unknown. Taxonomic relationships with *S. lateralis* are discussed in that account.

SYNONYMS. *Callospermophilus lateralis saturatus*, *Citellus saturatus*, *Spermophilus lateralis saturatus*, *Tamias lateralis saturatus*.

OTHER COMMON NAMES. Cascade Golden-mantled Ground Squirrel.

SUBSPECIES. None are recognized. Wright (1972) classified this taxon as a subspecies of *S. lateralis*.

Genus *Tamias*

Traditionally, the North American chipmunks were classified into two genera: *Tamias* (one eastern North American species) and *Eutamias* (all the western North American chipmunks). However, results from recent studies of chromosomal, biochemical and morphometric data support the recognition of a single genus, *Tamias*, in North America (Nadler *et al.* 1977; Levenson *et al.* 1985). The species of North American chipmunks were delimited in the classic revision by Howell (1929). Except for minor revisions, this classification was followed by Hall (1981). There are about 21 species in North America; 4 occur in the province. However, there is still disagreement on the number of valid species in the genus. Striking convergent and divergent evolution in cranial features used in traditional taxonomic studies has obscured the systematic relationships among members of the genus (Levenson *et al.* 1985).

Tamias amoenus J.A. Allen, 1890

Yellow-pine Chipmunk

This chipmunk is broadly distributed across western North America from California and Nevada to British Columbia and western Alberta. It occupies the central and southern parts of the province.

SYNONYMS. *Eutamias amoenus*, *Eutamias ludibundus*, *Tamias quadrivittatus felix*, *Tamias quadrivittatus luteiventris*.

OTHER COMMON NAMES. Northwestern Chipmunk.

SUBSPECIES. Howell (1929) recognized 10 subspecies; Hall (1981) listed 14 subspecies with 5 occurring in the province. The species is in need of a modern revision.

Tamias amoenus affinis

Original Description. Allen 1890: Bull. Amer. Mus. Nat. Hist. 3:103.
Type Locality. Aschcroft, British Columbia.
Type Specimen. AMNH 2019/1500.
Range. The eastern slopes of the Cascades in Washington and British Columbia, and the southern dry interior of the province from the Okanagan and Similkameen valleys north to Sorenson Lake.
Remarks. Cowan and Guiguet (1965) showed this race occupying the eastern slopes of the Cascades in the province, but Hall (1981) classified the populations from this region as *T. a. ludibundus*.

Tamias amoenus felix

Original Description. Rhoads 1895: Amer. Nat. 29:491.
Type Locality. Church (= Lihumitson) Mountain, 7,000 ft. (2,135 m), Mount Baker Range, British Columbia.
Type Specimen. ANSP 9355.
Range. A coastal race that ranges from the Cascade Mountains in extreme northern Washington to as far north as Bute Inlet in British Columbia. It has also been recorded from Savary Island off the coastal mainland.

Tamias amoenus ludibundus

Original Description. Hollister 1911: Smith. Misc. Collection 56(26):1.
Type Locality. Yellowhead (= Cowdung) Lake, 3,700 ft. (1,129 m), British Columbia.
Type Specimen. USNM 174225.
Range. According to Hall (1981), this race occupies the central Rocky Mountains of Alberta and British Columbia and extends westward through the province to the eastern slopes of the coastal mountain ranges as far south as Oregon.
Remarks. Cowan and Guiguet (1965) considered populations from the eastern slopes of coastal mountain ranges distinct from *ludibundus*.

Tamias amoenus luteiventris

Original Description. Allen 1890: Bull. Amer. Mus. Nat. Hist. 3:101.
Type Locality. Chief Mountain Lake (= Waterton Lake), 3.5 mi. (5.6 km) N of the United States-Canada boundary, Alberta.
Type Specimen. USNM 11991/37996.
Range. Montana, Idaho, Wyoming, northeastern Washington, the Rocky Mountains of central-southern Alberta and British Columbia where it inhabits the Purcell, Monashee, Selkirk and Rocky mountain ranges as far north as Glacier.

Tamias amoenus septentricnalis

Original Description. Cowan 1946: Proc. Biol. Soc. Wash. 59:110.
Type Locality. Ootsa Lake P.O., north shore Ootsa Lake, British Columbia.
Type Specimen. RBCM 1648.
Range. Restricted to the province where it inhabits the Interior Plateau area west of the Fraser River as far north as the Skeena River Valley.

Tamias minimus Bachman, 1839

Least Chipmunk

A boreal species, this chipmunk is distributed across Canada from the Yukon Territory to western Quebec and the north-central and western United States. It is found throughout the northern regions of the province, but it is restricted to the Rocky Mountains and Selkirk Mountains in the south.

SYNONYMS. *Eutamias caniceps*, *Eutamias minimus*, *Eutamias oreocetes*, *Tamias asiaticus borealis*.

OTHER COMMON NAMES. Western Chipmunk.

SUBSPECIES. Howell (1929) recognized 14 subspecies in his revision; Hall (1981) listed 18 races with 4 occurring in the province. The species is in need of a modern revision.

Tamias minimus borealis

Original Description. Allen 1877: Monog. N. Amer. Rodentia: 793.
Type Locality. Fort Liard, Northwest Territories.
Type Specimen. USNM 6506 (see Poole and Schantz 1942).
Range. Northern Montana and across Canada from the Yukon Territory and British Columbia to northern Ontario. It inhabits the northeastern and north-central parts of the province as far north as Babine Lake and the Peace River and a limited area in the southern Rocky Mountains (Mount Assiniboine Provincial Park).

Tamias minimus caniceps

Original Description. Osgood 1900: N. Amer. Fauna 19:28.
Type Locality. Lake Leberge, Yukon Territory.
Type Specimen. USNM 99200.
Range. The Yukon Territory, the western Northwest Territories, and northwestern and north-central British Columbia from the Haines Triangle to Summit Lake Pass.
Remarks. Youngman (1975) considered this race distinguishable from *T. m. borealis*.

Tamias minimus oreocetes

Original Description. Merriam 1897: Proc. Biol. Soc. Wash. 11:207.
Type Locality. Summit Mountain, N of Summit Station, Flathead Co., Montana.
Type Specimen. USNM 72468.
Range. Restricted to the Rocky Mountains of northern Montana, extreme southwestern Alberta and extreme southeastern British Columbia.
Remarks. Specimens from Mount Assiniboine Provincial Park were classified as *oreocetes* by Crowe (1943), but Cowan and Guiguet (1965) assigned these populations to the race *borealis*.

Tamias minimus selkirki

Original Description. Cowan 1946: Proc. Biol. Soc. Wash. 59:113.
Type Locality. Paradise Mine, near Toby Creek, 19 mi. (31 km) W of Invermere, British Columbia.
Type Specimen. UBC 1551.
Range. It is known only from the type locality in the Selkirk Range.

Tamias ruficaudus (A.H. Howell, 1920)

Red-tailed Chipmunk

T. ruficaudus is restricted to western Montana, northern Idaho, northeastern Washington, southwestern Alberta and southern British Columbia where it has a limited range in the southern Kootenays and the Rocky Mountains.

SYNONYMS. None.

OTHER COMMON NAMES. Rufous-tailed Chipmunk.

SUBSPECIES. Two subspecies were recognized by Howell (1929); both occur in the province. However, based on morphology of the male genital bone (i.e., baculum), White (1953) suggested that the two races may be distinct species. A multivariate study of bacular variation among populations of the two subspecies in the northern United States (Patterson and Heaney 1987) revealed no morphological overlap among the two taxa. These results support the hypothesis that the two subspecies are full species. Taxonomy of the Red-tailed Chipmunk in British Columbia is in need of study.

Tamias ruficaudus ruficaudus

Original Description. Howell 1920: Proc. Biol. Soc. Wash. 33:91.
Type Locality. Upper St. Marys Lake, Glacier Co., Montana.
Type Specimen. USNM 72294.
Range. Western Montana and the Rocky Mountains of extreme southwestern Alberta and southeastern British Columbia where it has been recorded from Akamina Pass and Sage Pass.

Tamias ruficaudus simulans

Original Description. Howell 1922: J. Mamm. 3:179.
Type Locality. Coeur d'Alene, Kootenai Co., Idaho.
Type Specimen. USNM 28487/40591.
Range. Northwestern Montana, northern Idaho, northeastern Washington and the southern Kootenays in British Columbia.

Tamias townsendii Bachman, 1839

Townsend's Chipmunk

This chipmunk is associated with the coastal lowlands and coastal mountain ranges from California to extreme southwestern British Columbia. Taxonomy of *Tamias townsendii* is complex. Traditionally, five subspecies were recognized in the species. However, based on a study of the male genital bone, Sutton and Nadler (1974) concluded that three subspecies inhabiting Oregon and California were full species, a conclusion not supported by genetic data (Levenson and Hoffmann 1984). A re-analysis of bacular and cranial variation in Townsend's Chipmunks for northwestern California and southwestern Oregon by Sutton (1987) indicated that there are four species in that region: *T. ochrogenys*, *T. senex*, *T. siskiyou* and *T. townsendii*. Further study of specimens from other parts of the range is needed to resolve the taxonomy of the Townsend's Chipmunk group.

SYNONYMS. *Eutamias townsendii*, *Tamias cooperi*.

OTHER COMMON NAMES. None.

SUBSPECIES. Howell (1929) recognized six subspecies. Hall and Kelson (1959), however, listed five races: *ochrogenys*, *cooperi*, *townsendii*, *siskiyou*, and *senex*; two occur in British

Columbia (*cooperi* and *townsendii*). Sutton and Nadler (1974), Hall (1981) and Sutton (1987) proposed that the races *ochrogenys*, *siskiyou* and *senex* are full species. In light of their findings, the taxonomic status of *cooperi* and *townsendii* should be assessed.

Tamias townsendii cooperi

Original Description. Baird 1855: Proc. Acad. Nat. Sci. Phil. 7:334.
Type Locality. Klickitat Pass, 4,500 ft. (1,373 m), Skamania Co., Washington.
Type Specimen. USNM 212/1183.
Range. The Cascade Range in Oregon, Washington and British Columbia where it is restricted to higher elevations.

Tamias townsendii townsendii

Original Description. Bachman 1839: J. Acad. Nat. Sci. Phil. 8:68.
Type Locality. Lower Columbia River, near the mouth of Willamette River, Oregon.
Type Specimen. ANSP 241.
Range. The coastal lowlands and lower western slopes of the Cascades in Oregon and Washington, the Olympic Mountains in Washington and the lower Fraser Valley in the province.
Remarks. Distribution of *townsendii* and *cooperi* in the province is in need of study.

Genus *Tamiasciurus*

This North American genus was first revised by Allen (1898) under the name *Sciurus*. Three species are recognized; two (Douglas' Squirrel, *Tamiasciurus douglasii*, and the Red Squirrel, *Tamiasciurus hudsonicus*) are found in the province. The ranges of *T. douglasii* and *T. hudsonicus* are parapatric in the Pacific Northwest with narrow zones (15-30 km wide) of overlap occurring in the Blue Mountains of eastern Oregon and the Cascade Mountains of north-central Washington and southwestern British Columbia. Within these zones of overlap some individuals appear intermediate in pelage colour and vocalizations suggesting that the two species hybridize in these regions. Smith (1981), for example, reported "hybrids" in British Columbia near Boston Bar in the Fraser River canyon and at Lightning Lake in Manning Provincial Park. However, Lindsay (1982) found that all specimens intermediate in pelage could be assigned to either species on the basis of skull morphology and he concluded that there was no evidence of hybridization.

Tamiasciurus douglasii (Bachman, 1839)

Douglas' Squirrel

A coastal squirrel, *T. douglasii* inhabits the coastal lowlands and coastal mountain ranges from California to southwestern British Columbia as far north as Rivers Inlet where it is replaced by *Tamiasciurus hudsonicus*.

SYNONYMS. *Sciurus douglasii*, *Sciurus molli-pilosus*.

OTHER COMMON NAMES. Chickaree.

SUBSPECIES. Subspecies were reviewed by Allen (1898), but there has been no recent revision. Hall (1981) listed four races; one is found in the province. Geographic variation in size was assessed by Lindsay (1986).

Tamiasciurus douglasii mollipilosus

Original Description. Audubon and Bachman 1841: Proc. Acad. Nat. Sci. Phil. 1:102.
Type Locality. Coast of northern California.
Type Specimen. None designated.
Range. Northern California, Oregon, Washington and British Columbia where it inhabits coastal lowlands and the Cascade and Coast ranges as far north as Rivers Inlet. Insular distribution of this race in the province is in need of further study. At present there are records from Bowen and Gambier islands in Howe Sound and Stuart, Redonda and Cortes islands near Desolation Sound.

Tamiasciurus hudsonicus (Erxleben, 1777)

Red Squirrel

This squirrel has a large range across Alaska, Canada and the United States. It occupies the entire mainland of the province (except for the southwestern coast) and numerous islands. Populations were introduced to the Queen Charlotte Islands from Vancouver Island in 1950 (Carl and Guiguet 1972).

SYNONYMS. *Sciurus hudsonicus*, *Sciurus hudsonicus petulans*, *Sciurus hudsonicus picatus*, *Sciurus hudsonicus richardsoni*, *Sciurus hudsonicus vancouverensis*, *Sciurus lanuginosus*, *Sciurus richardsoni*.

OTHER COMMON NAMES. None.

SUBSPECIES. There has been no overall revision of this species since the study by Allen (1898). Although Lindsay (1987) examined morphometric variation in Rocky Mountain populations, a study of geographic variation throughout the entire range is needed to resolve the taxonomy of this species. Hall (1981) listed 25 subspecies; 7 occur in the province.

Tamiasciurus hudsonicus columbiensis

Original Description. Howell 1936: Proc. Biol. Soc. Wash. 49:135.
Type Locality. Raspberry Creek, about 30 mi. (48 km) SE of Telegraph Creek, British Columbia.
Type Specimen. AMNH 19891.
Range. Western Alberta, the southern Yukon Territory, and northern and central British Columbia where it ranges east of the coastal mountain ranges from Lillooet east to Mount Robson and north to the Liard River.
Remarks. Youngman (1975) could not distinguish the races *columbiensis* and *preblei* in the Yukon Territory and he assigned all Yukon populations of *T. hudsonicus* to the subspecies, *preblei*.

Tamiasciurus hudsonicus lanuginosus

Original Description. Bachman 1839: Proc. Zool. Soc. London: 101.
Type Locality. Ft. McLaughlin, Campbell Island, British Columbia (see McCabe and Cowan 1945:164-165).
Type Specimen. ANSP 295.
Range. The coastal mainland from Rivers Inlet north to the Skeena River and various islands off the coastal mainland (Calvert, Campbell, Chatfield, Dufferin, Horsefall, Hunter, McCauley, Pitt, Porcher, Swindle, Townsend, Yeo). It also inhabits Vancouver Island and numerous adjacent islands.
Remarks. Systematics of the numerous insular populations in British Columbia has not been studied. It is unlikely that classifying all these populations as a single race realistically represents their range of taxonomic diversity.

Tamiasciurus hudsonicus petulans

Original Description. Osgood 1900: N. Amer. Fauna 19:27.
Type Locality. Glacier, White Pass, 1,870 ft. (570 m), Alaska.
Type Specimen. USNM 97457.
Range. Southeastern Alaska, the southwestern Yukon Territory and extreme northwestern British Columbia in the Haines Triangle area (see Cowan and Guiguet 1965).
Remarks. Youngman (1975) assigned Yukon specimens from the southwestern Yukon Territory to *T. h. preblei*.

Tamiasciurus hudsonicus picatus

Original Description. Swarth 1921: J. Mamm. 2:92.
Type Locality. 25 mi. (40 km) S of Kake Village, Kupreanof Island, Alexander Archipelago, Keku Straits, Alaska.
Type Specimen. MVZ 8767.
Range. Mainland and islands of southeastern Alaska and the coastal mainland of northwestern British Columbia from Telegraph Creek south to the Skeena River.

Tamiasciurus hudsonicus preblei

Original Description. Howell 1936: Proc. Biol. Soc. Wash. 49:133.
Type Locality. Fort Simpson, Northwest Territories.
Type Specimen. USNM 133862.
Range. Alaska, the Yukon Territory, the Northwest Territories, Alberta, Saskatchewan and the Peace River-Fort Nelson region in the province.

Tamiasciurus hudsonicus richardsoni

Original Description. Bachman 1838: Proc. Zool. Soc. London: 100.
Type Locality. Head of Big Lost River, Fremont Co., Idaho.
Type Specimen. Not known to exist.
Range. Oregon, Idaho, Montana, extreme southwestern Alberta and southeastern British Columbia where it occupies the Rocky, Purcell and Selkirk mountain ranges as far north as Field.

Tamiasciurus hudsonicus streatori

Original Description. Allen 1898: Bull. Amer. Mus. Nat. Hist. 10:267.
Type Locality. Ducks, British Columbia.
Type Specimen. AMNH 2054.
Range. Northern Idaho and Washington and south-central British Columbia where its eastern limits extend from Midway to Glacier and its western limits from Manning Provincial Park to Lillooet.

Family Zapodidae — Jumping Mice

Genus *Zapus*

This North American genus was revised by Krutzsch (1954), who recognized three species: Meadow Jumping Mouse (*Z. hudsonius*), Western Jumping Mouse (*Z. princeps*) and Pacific Jumping Mouse (*Z. trinotatus*). All occur in the province. The classification of Krutzsch (1954) was adopted by Hall (1981) and Honacki *et al.* (1982). However, in a comprehensive study of the genus, based heavily on dental characters, Jones (1981) proposed radical changes to the taxonomy of *Zapus* that includes the recognition of only two species, with *Z. trinotatus* and *Z. princeps* conspecific.

Zapus hudsonius (Zimmermann, 1780)

Meadow Jumping Mouse

Found across Alaska, Canada and the central and eastern United States, *Z. hudsonius* occupies the northern and central parts of the province. Distributions of *Z. hudsonius* and the Western Jumping Mouse (*Z. princeps*) overlap broadly in central British Columbia and in this region the two species may occur in the same habitat (Jones 1981).

SYNONYMS. *Dipus hudsonius*, *Dipus labradorius*, *Gerbillus canadensis*, *Gerbillus labradorius*, *Jaculus labradorius*, *Meriones labradorius*, *Zapus tenellus*.

OTHER COMMON NAMES. None.

SUBSPECIES. In his revision Krutzsch (1954) recognized 11 subspecies; 3 occur in the province. Relict populations in the southwestern United States evidently represent an additional

race, *Z. hudsonius luteus* (Hafner *et al.* 1981). Jones (1981) concluded that the patterns of geographic variation in dental morphology do not support the taxonomy of Krutzsch (1954) and recommended that no subspecies be recognized for *Z. hudsonius*. A detailed study of geographic variation utilizing morphological and genetic data is needed to resolve the taxonomy of this species.

Zapus hudsonius alascensis

Original Description. Merriam 1897: Proc. Biol. Soc. Wash. 2:223.
Type Locality. Yakutat Bay, Alaska.
Type Specimen. USNM 73584.
Range. Alaskan Peninsula, coastal mainland of southern Alaska and the Haines Triangle area of extreme northwestern British Columbia.

Zapus hudsonius hudsonius

Original Description. Zimmermann 1780: Geog. Geschichted Menschen U. Vierfussigen Thiere 2:358.
Type Locality. Hudson Bay (Fort Severn), Ontario.
Type Specimen. Not known to exist.
Range. Central Alaska and northern Canada from the Yukon Territory to Ontario. It occupies the northern half of the province except for the Haines Triangle.

Zapus hudsonius tenellus

Original Description. Merriam 1897: Proc. Biol. Soc. Wash. 11:103.
Type Locality. Kamloops, British Columbia.
Type Specimen. USNM 66932.
Range. Restricted to central and south-central areas of the province where it ranges from Burns Lake and Prince George as far south as Lillooet and Vernon.

Zapus princeps J.A. Allen, 1893

Western Jumping Mouse

Inhabiting western Canada and the United States this species is found throughout the entire mainland of British Columbia except for the extreme southwest. Taxonomic relationships between *Z. princeps* and the coastal species *Z. trinotatus* are controversial. The two taxa were treated as a single species by Dalquest (1948) and Jones (1981); and as separate species by Krutzsch (1954), Cowan and Guiguet (1965), Hall (1981) and Honacki *et al.* (1982). In British Columbia, the two taxa overlap at Allison Pass in Manning Provincial Park in the Cascade Mountains. Krutzsch (1954) and Cowan and Guiguet (1965) concluded that there was no intergradation in this region, but Jones (1981) reported intergradation in dental morphology, suggesting that the two forms interbreed.

SYNONYMS. *Zapus saltator*.

OTHER COMMON NAMES. None.

SUBSPECIES. Krutzsch (1954) recognized 11 subspecies; Hall (1981) listed 12 races. The relict subspecies, *Z. princeps luteus*, from the southwestern United States is actually *Z. hudsonius* (Hafner *et al.* 1981). Three races occur in the province. Jones (1981) proposed radical revisions to the taxonomy of *Z. princeps*. According to his taxonomy, all British Columbia populations of *Z. princeps* and *Z. trinotatus* represent a single subspecies *Z. princeps princeps*. A comprehensive study of geographic variation is needed.

Zapus princeps idahoensis

Original Description. Davis 1931: J. Mamm. 15:221.
Type Locality. 5 mi. (8 km) E of Warm Lake, 7,000 ft. (2,135 m), Valley Co., Idaho.
Type Specimen. MVZ 54845.
Range. Northern Idaho, Montana, Wyoming, southwestern Alberta and extreme southeastern British Columbia where it occupies the Rocky Mountains and Rocky Mountain trench as far north as Mount Assiniboine.

Zapus princeps kootenayensis

Original Description. Anderson 1932: Ann. Rept. Nat. Mus. Canada 1931:108.
Type Locality. Green Mountain, head of Murphy Creek, 10 mi. (16 km) N of Rossland, British Columbia.
Type Specimen. NMC 10020.
Range. Extreme northern Idaho, northeastern Washington and southern British Columbia as far north as Barkerville and as far west as Allison Pass in Manning Provincial Park.

Zapus princeps saltator

Original Description. Allen 1899: Bull. Amer. Mus. Nat. Hist. 12:3.
Type Locality. Telegraph Creek, British Columbia.
Type Specimen. AMNH 14408.
Range. Southeastern Alaska, the south-central Yukon Territory, western Alberta and the entire northern and central regions of the province.

Zapus trinotatus Rhoads, 1895

Pacific Jumping Mouse

A coastal species that inhabits California, Oregon, Washington and extreme southwestern British Columbia. Taxonomic relationships with *Z. princeps* are discussed in that account.

SYNONYMS. *Zapus imperator*, *Zapus princeps trinotatus*.

OTHER COMMON NAMES. None.

SUBSPECIES. Krutzsch (1954) recognized four subspecies in his revision; one occurs in the province.

Zapus trinotatus trinotatus

Original Description. Rhoads 1895: Proc. Acad. Nat. Sci. Phil. 46:421.
Type Locality. Lulu Island, Fraser River, British Columbia.
Type Specimen. ANSP 7360.
Range. The coastal regions of northern California and Oregon, coastal areas west of the Cascades in Washington, and extreme southwestern British Columbia where it occurs as far north as Garibaldi Provincial Park and east to Allison Pass in Manning Provincial Park.
Remarks. Jones (1981) concluded that this taxon is synonymous with *Z. princeps princeps*.

Order Carnivora — Carnivores

Family Canidae — Canids

Genus *Canis*

A comprehensive study of the systematics of North American species was made by Nowak (1979) using morphometric data. There are three wild species in North America; two, *Canis lupus* (Gray Wolf) and *Canis latrans* (Coyote), occur in the province. In eastern North America the taxonomy of *Canis* is complicated by the extirpation of some of the original populations of *C. lupus* and recent range expansions by *C. latrans*. Moreover, morphologically intermediate animals have been interpreted as evidence of hybridization between various species of *Canis* including the domestic dog (*C. familiaris*).

Canis latrans Say, 1823

Coyote

Found across North America and Middle America, *C. latrans* inhabits the entire mainland of British Columbia. During the past 100 years, *C. latrans* has expanded its range into eastern North America in response to habitat changes and extirpation of *C. lupus*, and hybridization may have occurred in that region with *C. lupus* and *C. familiaris* (see Nowak 1979 for review). Possible hybridization in British Columbia populations of *C. latrans* has not been studied.

SYNONYMS. *Canis lestes*.

OTHER COMMON NAMES. Brush Wolf.

SUBSPECIES. Subspecies were last revised by Jackson (1951) and his 19 subspecies were adopted by Hall (1981). Two of these races are found in the province. Systematics of *C. latrans* in eastern North America has been studied in detail but there has been no comparable research on western North American populations. Nowak (1978) noted that some of the 19 races recognized by Jackson (1951) are questionable.

Canis latrans incolatus

Original Description. Hall 1934: Univ. Calif. Pub. Zool. 40:369.
Type Locality. Isaacs Lake, 3,000 ft. (915 m), British Columbia.
Type Specimen. MVZ 43898.
Range. Alaska, the Yukon Territory, the western Northwest Territories, northern Alberta, and northern and central British Columbia.
Remarks. Youngman (1975) noted that the characters separating the races *C. l. latrans*, *C. l. incolatus* and *C. l. lestes* were subjective and he recommended that the three races be synonymized.

Canis latrans lestes

Original Description. Merriam 1897: Proc. Biol. Soc. Wash. 11:25.
Type Locality. Toyabe Mountains, Nye Co., Nevada.
Type Specimen. USNM 24452/32347.
Range. The western United States, southwestern Alberta and southern British Columbia as far north as Bella Coola and Mount Robson.

Canis lupus Linnaeus, 1758

Gray Wolf

Ranging across North America and Middle America and Eurasia, *C. lupus* has one of the broadest distributions of any mammal. In British Columbia it occupies the entire mainland, Vancouver Island and some adjacent islands. Possible hybridization between *C. lupus* and *C. latrans* has not been studied in British Columbia. Friis (1985) reported a few putative hybrids between *C. lupus* and *C. familiaris* on Vancouver Island.

SYNONYMS. *Canis occidentalis*, *Lupus gigas*.

OTHER COMMON NAMES. Timber Wolf.

SUBSPECIES. Subspecies were revised by Goldman (1944) who described 24 races, with 6 occurring in the province. His taxonomy was adopted by Hall (1981), although Cowan and Guiguet (1965) recognized only three subspecies in the province. The taxonomy of Goldman (1944) was based on limited samples and subjective methods. Moreover, changes in the original range of *C. lupus*, including the extinction of some original races followed by the reinvasion of different subspecies, has altered the taxonomy proposed by Goldman (1944). Geographic variation in western Canadian populations of *C. lupus* was investigated by Jolicoeur (1959), Skeel and Carbyn (1977), and Friis (1985) using multivariate analyses of skull morphology. Nowak (1983) and Friis (1985) proposed major changes to the taxonomy of Goldman (1944). Nowak (1983) concluded that the North American populations of *C. lupus* fell into five groups, with two of these (the large northern morph and small southern morph) ranging across much of the continent. According to Friis (1985) morphology of current *C. lupus* populations in British Columbia is consistent with the two groups proposed by Nowak (1983), with a small southern group comprising coastal and Vancouver Island populations and a large northern group consisting of populations from the northern interior. Although her results suggest that there are probably only two valid races in the province, Friis (1985) did not formally revise Goldman's nomenclature.

Canis lupus columbianus

Original Description. Goldman 1941: Proc. Biol. Soc. Wash. 54: 110.
Type Locality. Wistaria, north side of Ootsa Lake, British Columbia.
Type Specimen. RBCM 3559.
Range. Goldman (1944) described its range as the southern Yukon Territory, the Rocky Mountains of Alberta and most of British Columbia east of the coastal mountain ranges except for northeast. Friis (1985), however, concluded that *C. l. columbianus* occupies all of northern British Columbia.
Remarks. Although Goldman (1944) assigned populations from northeastern British Columbia to the race *C. l. occidentalis*, Friis (1985) concluded that populations in this region are indistinguishable from *C. l. columbianus*.

Canis lupus crassodon

Original Description. Hall 1932: Univ. Calif. Publ. Zool. 38:420.
Type Locality. Tahsis Canal, Nootka Sound, Vancouver Island, British Columbia.
Type Specimen. MVZ 12456.
Range. Restricted to Vancouver Island.
Remarks. Although the original historic population inhabiting Vancouver Island was a well-defined subspecies, the race *crassodon* has been modified by immigration from the coastal mainland during the past two decades and the present wolf populations on Vancouver Island are indistinguishable from coastal mainland populations (Friis 1985).

Canis lupus fuscus

Original Description. Richardson 1839: Mammalia, Zoology of Captain Beechey's Voyage, London: 5.
Type Locality. California and the banks of the Columbia River.
Type Specimen. Not known to exist.
Range. Goldman (1944) described its range as northern California, western Oregon and Washington, and extreme southwestern British Columbia; Cowan and Guiguet (1965) showed the range of *fuscus* extending along the entire British Columbia coastal mainland and various coastal islands. Friis (1985), however, suggested that this race may never have occurred in the province.
Remarks. Friis (1985) concluded that this race is now extinct.

Canis lupus irremotus

Original Description. Goldman 1937: J. Mamm. 18:41.
Type Locality. Red Lodge, Carbon Co., Montana.

Type Specimen. USNM 214869.
Range. Originally this race inhabited Idaho, Montana, Wyoming, eastern Oregon and Washington, southwestern Alberta and southeastern British Columbia.
Remarks. Friis (1985) concluded that this race is now extinct. It was either modified or replaced by immigration from northern populations.

Canis lupus ligoni

Original Description. Goldman 1937: J. Mamm. 18:39.
Type Locality. Head of Duncan Canal, Kupreanof Island, Alexander Archipelago, Alaska.
Type Specimen. USNM 243323.
Range. Goldman (1944) described its range as the Alexander Archipelago and adjacent mainland of Alaska. Anderson (1946) and Hall (1981) speculated that it may occur also on the adjacent coastal mainland of British Columbia.
Remarks. Friis (1985) found that *C. l. ligoni* from Alaska are weakly differentiated from coastal British Columbia populations.

Genus *Vulpes*

There are three species in North America; one is found in British Columbia.

Vulpes vulpes (Linnaeus, 1758)

Red Fox

Distributed across Eurasia and much of the North American continent, *V. vulpes* inhabits the entire mainland east of the coastal mountains. A population was established on eastern Vancouver Island through fur-farm escapes (Carl and Guiguet 1972) but it is now extinct. Introductions from fur-farm animals also occurred in the southern interior of the province.

SYNONYMS. *Vulpes alascensis abietorum*, *Vulpes cascadensis*, *Vulpes fulvus*, *Vulpes macroura*.

OTHER COMMON NAMES. None.

SUBSPECIES. There has been no recent revision of subspecies. Hall (1981) listed ten subspecies, with three occurring in the province. However, Cowan and Guiguet (1965) noted that the taxonomy of *V. vulpes* in south-central British Columbia is obscured by introductions. Similarly Aubry (1984) concluded that the only populations of *V. vulpes* indigenous to Washington State are those inhabiting the Cascade Mountains; coastal lowland and northeastern populations in the state are derived from introductions.

Vulpes vulpes abietorum

Original Description. Merriam 1900: Proc. Wash. Acad. Sci. 2:669.
Type Locality. Stuart Lake, British Columbia.
Type Specimen. USNM 71197.
Range. Northern Saskatchewan, Alberta, the southern Northwest Territories and Yukon Territory, and northern and central British Columbia.
Remarks. Youngman (1975) found no differences between *V. vulpes abietorum* and *V. vulpes alascensis* and recommended that *abietorum* be considered a synonym of *alascensis*.

Vulpes vulpes cascadensis

Original Description. Merriam 1900: Proc. Wash. Acad. Sci. 2:665.
Type Locality. Trout Lake, Mount Adams, Skamania Co., Washington.
Type Specimen. USNM 92767.
Range. Oregon, the Cascade Mountains in Washington and British Columbia where it inhabits the lower Fraser Valley, the Cascade Mountains and the southern Coast Mountains (Hall 1981). Cowan and Guiguet (1965) assigned populations in southeastern British Columbia to this race as well.

Remarks. Populations inhabiting the coastal lowlands of Washington were introduced (Aubry 1984) and these introductions may have obscured the taxonomy of *V. vulpes* in the lower Fraser Valley of British Columbia.

Vulpes vulpes macroura

Original Description. Baird 1852. In Stanbury, Exploration and Survey of Great Salt Lake: 309.
Type Locality. Wasatch Mountains, Utah.
Type Specimen. USNM 4107.
Range. The Rocky Mountains of the United States and southern Alberta, and southeastern British Columbia.
Remarks. Cowan and Guiguet (1965) classified populations in the southeast as *cascadensis*.

Family Felidae — Cats

Genus *Felis*

There is considerable disagreement on the limits of this genus (Hemmer 1978; Honacki *et al.* 1982). Five species occur in North America; one is found in British Columbia.

Felis concolor Linnaeus, 1771

Cougar

F. concolor is found throughout most of North, Middle and South America. In British Columbia it occupies the central and southern mainland and adjacent islands including Vancouver Island. Some taxonomists (e.g., Hemmer 1978; Collier and O'Brien 1985) considered this cat sufficiently distinct to warrant classification in a separate genus *Puma*; however, Honacki *et al.* (1982) placed the cougar in the genus *Felis*.

SYNONYMS. *Felis hippolestes olympus*, *Puma concolor*.

OTHER COMMON NAMES. Mountain Lion, Puma.

SUBSPECIES. Geographic variation and subspecies were assessed by Goldman (1946) who recognized 14 subspecies in North America, with 3 occurring in the province. Hall (1981) adopted the taxonomy of Goldman (1946). Kurtén (1973a) demonstrated that size increases clinally from the equator in both the northern and southern hemispheres. There has been no recent revision of subspecies.

Felis concolor oregonensis

Original Description. Rafinesque 1832: Atlantic J. 1:62.
Type Locality. Ohanapecosh River, Mount Rainier National Park, Washington.
Type Specimen. None designated.
Range. Western Oregon, Washington and British Columbia where it occurs in the Cascades and southern Coast Mountains as far north as Jervis Inlet.

Felis concolor missoulensis

Original Description. Goldman 1943: J. Mamm. 24:229.
Type Locality. Sleeman Creek, 10 mi. (16 km) SW of Missoula, Missoula Co., Montana.
Type Specimen. USNM 262116.
Range. Idaho, Montana, North Dakota and western Canada. It occupies the southern and central interior and the central coast from Jervis Inlet to the Skeena River.
Remarks. According to Cowan and Guiguet (1965) its precise boundaries with *oregonensis* in British Columbia are unknown.

Felis concolor vancouverensis

Original Description. Nelson and Goldman 1932: Proc. Biol. Soc. Wash. 45:105.
Type Locality. Campbell Lake, Vancouver Island, British Columbia.
Type Specimen. USNM 211519.
Range. Restricted to Vancouver Island and larger adjacent islands.

Genus *Lynx*

Some taxonomists consider the lynx a member of the genus *Felis* (Corbet 1978; Hemmer 1978); others treat it as a separate genus, *Lynx* (Werdelin 1981; Honacki *et al.* 1982). Biochemical data support the validity of the genus *Lynx* (Collier and O'Brien 1985). There are two species in North America, both are found in the province. The genus was revised by Werdelin (1981).

Lynx canadensis Kerr, 1792

Lynx

Kerr, 1792. Anim. King. vol. 1:157. Type Locality, eastern Canada. Type Specimen, not known to exist.

Found throughout the boreal regions of North America, *L. canadensis* occupies the entire mainland. Taxonomic affinities with the closely related Eurasian lynx (*Lynx lynx*) have been controversial. Kurtén and Rausch (1959) and Tumlison (1987) considered the two taxa to be conspecific but Werdelin (1981) treated them as separate species.

SYNONYMS. *Felis canadensis*, *Lynx borealis*, *Lynx canadensis canadensis*.

OTHER COMMON NAMES. Canada Lynx.

SUBSPECIES. Traditionally, two subspecies were recognized (Hall 1981): one restricted to Newfoundland, the other ranging throughout the North American continent. Recent morphometric studies (van Zyll de Jong 1975; Werdelin 1981) have demonstrated that this species is remarkably uniform across its range and the recognition of two races is unwarranted.

Lynx rufus (Schreber, 1776)

Bobcat

Broadly distributed across Mexico, the United States and southern Canada, *L. rufus* occupies the southern and central interior in the province.

SYNONYMS. *Felis rufus*, *Lynx fasciatus*.

OTHER COMMON NAMES. Bay Lynx.

SUBSPECIES. Subspecies were revised in part by Grinnell and Dixon (1924) and Peterson and Downing (1952). Hall (1981) listed 11 races in North America; 2 occur in the province. However, results from studies by van Zyll de Jong (1975), Werdelin (1981) and Schmidly and Read (1986) suggest that the species is in need of a complete revision.

Lynx rufus fasciatus

Original Description. Rafinesque 1817: Amer. Monthly Magazine 2:46.
Type Locality. "Northwest coast" probably near the mouth of the Columbia River.
Type Specimen. None designated.
Range. A coastal race that ranges from California to Bute Inlet in British Columbia.

Lynx rufus pallescens

Original Description. Merriam 1900: N. Amer. Fauna 16:104.
Type Locality. Mount Adams, near Trout Lake, Skamania Co., Washington.
Type Specimen. USNM 76585.
Range. The western United States, southern Saskatchewan and Alberta, and south-central British Columbia as far north as the Peace River area.

Family Mustelidae — Mustelids

Genus *Enhydra*

There is one species in the genus.

Enhydra lutris (Linnaeus, 1758)

Sea Otter

Historically *E. lutris* inhabited coastal regions of the North Pacific. In the eastern Pacific it ranged from the Aleutian Islands of Alaska to Baja California. Original populations were heavily exploited and, by 1930, eastern Pacific populations were restricted to Alaska and central California. British Columbia populations were extirpated by the late 1920s. However, a population was re-established on the northwest coast of Vancouver Island by transplanting animals from Alaska in 1969-1972 (Bigg and MacAskie 1978). The present population on Vancouver Island is estimated at 300.

SYNONYMS. *Enhydra lutris nereis*, *Enhydra marina*, *Latax lutris*, *Lutra marina*, *Mustela lutris*, *Pusa orientalis*.

OTHER COMMON NAMES. None.

SUBSPECIES. Geographic variation and subspecies were assessed by Roest (1973) who recognized two races: *lutris* and *gracilis*. *E. l. gracilis* inhabits the Kurile Islands and southern Kamchatka Peninsula in the U.S.S.R.; *lutris* occupies the Commander Islands, the Aleutians, southwestern Alaska, British Columbia and California. Davis and Lidicker (1975) recommended that the California population be designated as a distinct subspecies *E. l. nereis*, but Roest (1976) concluded that the California population represented one extreme in a size cline that extends across the eastern Pacific.

Enhydra lutris lutris

Original Description. Linnaeus 1758: Syst. Nat. ed. 10,1:45.
Type Locality. Kamchatka, U.S.S.R. (see Roest 1973).
Type Specimen. None designated.
Range. From the Commander Islands eastward through the Aleutian Islands and southwestern Alaska as far south as central California. Re-introduced to Vancouver Island in 1969-1972.

Genus *Gulo*

One species is recognized in the genus.

Gulo gulo (Linnaeus, 1758)

Wolverine

G. gulo is a holarctic species that ranges across Eurasia and North America. It occupies Vancouver Island and most of the mainland in the province. North American populations were originally considered to be a distinct species *Gulo luscus*, but Kurtén and Rausch (1959) demonstrated that the New and Old World forms are conspecific.

SYNONYMS. *Gulo luscus*, *Gulo niediecki*.

OTHER COMMON NAMES. None.

SUBSPECIES. Kurtén and Rausch (1959) recognized only two subspecies with all North American populations classified as a single race *G. g. luscus*. Hall (1981), however, recognized four races in North America; two are found in the province. A detailed study of variation throughout the entire range is needed.

Gulo gulo luscus

Original Description. Linnaeus 1766: Syst. Nat. ed. 12,1:71.
Type Locality. Hudson Bay.
Type Specimen. Not known to exist.
Range. Broadly distributed across Alaska, Canada and the northwestern United States. It occupies the entire mainland of the province.

Gulo gulo vancouverensis

Original Description. Goldman 1935: Proc. Biol. Soc. Wash. 48:177.
Type Locality. Great Central Lake, Vancouver Island, British Columbia.
Type Specimen. USNM 211499.
Range. An insular race restricted to Vancouver Island.
Remarks. Few museum specimens exist for this subspecies. Banci (1982) compared the known specimens from Vancouver Island with material from the mainland and found little evidence for classifying the Vancouver Island population as a distinct subspecies.

Genus *Lontra*

The genus was revised by van Zyll de Jong (1972); one species occurs in North America. Although van Zyll de Jong (1972) proposed that the New World river otters be classified in a separate genus, *Lontra*, this has not been widely accepted by mammalogists (Kellnhauser 1983). Nonetheless, phylogenetic analyses of morphological characters (van Zyll de Jong 1987) indicate that the New and Old World river otters belong in separate genera, i.e. *Lontra* and *Lutra*.

Lontra canadensis (Schreber, 1776)

River Otter

Found throughout the North American continent, *L. canadensis* occupies the entire mainland and coastal regions of British Columbia including Vancouver Island and the Queen Charlotte Islands.

SYNONYMS. *Lutra canadensis*, *Lutra canadensis evexa*, *Lutra canadensis mira*, *Lutra canadensis pacifica*, *Lutra canadensis periclyzomae*, *Lutra hudsonica pacifica*, *Lutra mira*, *Lutra periclyzomae*, *Lutra vancouverensis*.

OTHER COMMON NAMES. Canadian River Otter.

SUBSPECIES. Van Zyll de Jong (1972) recognized seven subspecies; three occur in the province.

Lontra canadensis mira

Original Description. Goldman 1935: Proc. Biol. Soc. Wash. 48:185.
Type Locality. Prince of Wales Island, Alexander Archipelago, Alaska.
Type Specimen. USNM 127888.
Range. Southeastern Alaska including the Alexander Archipelago and British Columbia where it inhabits Vancouver Island, the coastal mainland and its associated islands (except the Queen Charlotte Islands).

Lontra canadensis pacifica

Original Description. Rhoads 1898: Trans. Amer. Phil. Soc. 19:429.
Type Locality. Lake Keechelus, 8,000 ft. (2,440 m), Kittitas Co., Washington.
Type Specimen. ANSP 7616.
Range. An immense range across the western United States, Alaska, and western and northern Canada. It occupies the entire mainland east of the coastal mountain ranges.

Lontra canadensis periclyzomae

Original Description. Elliot 1905: Proc. Biol. Soc. Wash. 18:80.
Type Locality. Gawi, Moresby Island, Queen Charlotte Island, British Columbia.
Type Specimen. FMNH 17724 (see Sanborn 1947).
Range. An insular race restricted to the Queen Charlotte Islands.

Genus *Martes*

The genus was revised by Hagmeier (1955) and Anderson (1970). Two species occur in North America; both inhabit British Columbia.

Martes americana (Turton, 1806)

Marten

Distributed across the boreal regions of Alaska, Canada, and the western United States, this mustelid inhabits the entire mainland of the province and some islands including Vancouver Island and the Queen Charlotte Islands. Taxonomic relationships with the Old World martens *M. martes*, *M. zibellina* and *M. melampus* are still unresolved. Hagmeier (1961) suggested that the four taxa may be a single circumboreal species. There are two morphotypes in North America that differ in cranial features: the *americana* and *caurina* morphs. The *americana* morph ranges from Newfoundland to Alaska, British Columbia, northern Idaho and northern Montana; the *caurina* morph inhabits the Pacific coast (including some coastal islands) from California to Alaska, and the Rocky Mountains and Sierra Nevada of the United States. Some taxonomists considered the two as distinct species (Grinnell and Dixon 1926; Dalquest 1948), but morphometric intergradation in northern Idaho and Montana of the United States and in Manning Provincial Park, British Columbia has been interpreted as evidence that the two morphs are a single species (Wright 1953; Hagmeier 1961).

SYNONYMS. *Martes americana vancouverensis*, *Martes caurina*, *Martes caurina vancouverensis*, *Mustela americana actuosa*, *Mustela caurina*, *Mustela nesophila*.

OTHER COMMON NAMES. American marten, Pine Marten.

SUBSPECIES. Fourteen subspecies (seven in the *americana* group, seven in the *caurina* group) are traditionally recognized (Hall 1981). Five are found in the province: three from the *caurina* group (*caurina*, *nesophila*, *vancouverensis*) and two from the *americana* group (*abietinoides*, *actuosa*). Hagmeier (1955, 1958, 1961) demonstrated that the *caurina* and *americana* morphs are morphologically distinct, but he found little evidence of obvious groups within these morphs and concluded that the use of subspecies in *M. americana* is inappropriate. Dillon (1961), however, re-examined Hagmeier's data and suggested that there are five valid subspecies in the *americana* group. In a multivariate study Giannico and Nagorsen (1989) reported several distinct morphological groups among *caurina* forms from coastal British Columbia and Alaska. A modern study of geographic variation across the entire range of *M. americana* is needed to evaluate subspecies and relationships between the *caurina* and *americana* morphs.

Martes americana abietinoides

Original Description. Gray 1865: Proc. Zool. Soc. London: 106.
Type Locality. Western slope of the Rocky Mountains somewhere between Kicking Horse Pass and the Columbia River.
Type Specimen. None designated.
Range. Western Alberta, northern Idaho and Montana, and southern-central British Columbia east of the Coastal Mountains.

Martes americana actuosa

Original Description. Osgood 1900: N. Amer. Fauna. 19:43.
Type Locality. Fort Yukon, Alaska.
Type Specimen. USNM 6043.
Range. Alaska, the Yukon Territory, the Northwest Territories, northern Alberta and northern British Columbia.

Martes americana caurina

Original Description. Merriam 1890: N. Amer. Fauna 4:27.
Type Locality. Near Gray's Harbor, Chehalis (= Grays Harbor) Co., Washington.
Type Specimen. USNM 186450.
Range. A coastal subspecies ranging from Oregon to northern British Columbia. Precise northern limits of this race are unknown.
Remarks. Hall (1981) treated the Vancouver Island population as a separate race (*M. a. vancouverensis*), but Hagmeier (1961), Cowan and Guiguet (1965), and Giannico and Nagorsen (1989) noted that the Vancouver Island population is indistinguishable from coastal mainland populations. They concluded that *vancouverensis* should be synonymized with *M. a. caurina*.

Martes americana nesophila

Original Description. Osgood 1901: N. Amer. Fauna 21:33.
Type Locality. Masset, Graham Island, Queen Charlotte Islands, British Columbia.
Type Specimen. USNM 78066.
Range. Swarth (1911) and Hagmeier (1955, 1961) considered this race to inhabit both the Queen Charlotte Islands and Alexander Archipelago, but Giannico and Nagorsen (1989) concluded that the name *nesophila* should be applied only to the Queen Charlotte Islands population.
Remarks. Giannico and Nagorsen (1989) demonstrated that this race is strongly differentiated from other coastal populations.

Martes pennanti (Erxleben, 1777)

Fisher

This species has an extensive range across the northeastern and western United States and most of northern Canada. It is found throughout most of the mainland of the province.

SYNONYMS. *Mustela canadensis pacifica*.

OTHER COMMON NAMES. None.

SUBSPECIES. Hall (1981) listed three subspecies; two occur in the province. Hagmeier (1959), however, reported that geographic variation in *M. pennanti* is slight and recommended that no subspecies be recognized. A modern study of geographic variation throughout the entire range is required to evaluate the validity of the races recognized by Hall (1981).

Martes pennanti columbiana

Original Description. Goldman 1935: Proc. Biol. Soc. Wash. 48:176.
Type Locality. Stuart Lake, British Columbia.
Type Specimen. USNM 56953.
Range. The northern regions of the prairie provinces, Idaho, the southern Northwest Territories, the southern Yukon Territory and the mainland of the province east of the coastal mountain ranges.

Martes pennanti pacifica

Original Description. Rhoads 1898. Trans. Amer. Phil. Soc. 19:435.
Type Locality. Lake Keechelus, 8,000 ft. (2,440 m), Kittitas Co., Washington.
Type Specimen. ANSP 8074.
Range. California, Oregon, Washington and the Pacific coast of British Columbia.
Remarks. Cowan and Guiguet (1965) considered this race to be inseparable from *M. p. pennanti*.

Genus *Mephitis*

Two species are recognized in the genus; one is found in British Columbia. The genus was first revised by Howell (1901) under the name *Chincha*.

Mephitis mephitis (Schreber, 1776)

Striped Skunk

M. mephitis inhabits northern Mexico, the United States and most of southern and central Canada. In the province it occupies mainland areas east of the coastal mountain ranges and the lower Fraser Valley.

SYNONYMS. *Chincha hudsonica*, *Chincha occidentalis spissigrada*, *Mephitis spissigrada*.

OTHER COMMON NAMES. None.

SUBSPECIES. There has been no recent assessment of subspecies. Hall (1981) listed 13 subspecies; 2 occur in the province.

Mephitis mephitis hudsonica

Original Description. Richardson 1829: Fauna Boreali-Americana 1:65.
Type Locality. Plains of Saskatchewan.
Type Specimen. None designated.
Range. Western Canada and the United States. In British Columbia it occupies the mainland east of the coastal mountains.

Mephitis mephitis spissigrada

Original Description. Bangs 1898: Proc. Biol. Soc. Wash. 12:31.
Type Locality. Sumas, British Columbia.
Type Specimen. MCZ B3699.
Range. The pacific coast of Oregon and Washington and the lower Fraser Valley in British Columbia.

Genus *Mustela*

Youngman (1982) investigated the phenetic relationships among Old and New World species of the genus using numerical methods. There are five species in North America; four occur in the province. North American species were revised in part (i.e. the weasels) by Hall (1951).

Mustela erminea Linnaeus, 1758

Ermine

A holarctic species found across the boreal and arctic regions of Eurasia and North America, *M. erminea* inhabits the entire mainland of British Columbia and various islands including the Queen Charlotte Islands and Vancouver Island.

SYNONYMS. *Mustela cicognanii*, *Mustela cicognanii anguinae*, *Mustela haidarum*, *Mustela microtis*, *Mustela richardsoni*, *Putorius haidarum*, *Putorius macrotis*, *Putorius richardsoni*, *Putorius streatori*.

OTHER COMMON NAMES. Short-tailed Weasel, Stoat.

SUBSPECIES. North American subspecies were revised by Hall (1951) who recognized 20 subspecies, with 5 occurring in the province. Ralls and Harvey (1985) described the patterns of size variation in North American continental populations, but they did not assess the validity of subspecies described by Hall (1951).

Mustela erminea anguinae

Original Description. Hall 1932: Univ. Calif. Pub. Zool. 38:417.
Type Locality. French Creek, Vancouver Island, British Columbia.
Type Specimen. MVZ 12482.
Range. An insular race restricted to Vancouver Island and some adjacent islands.

Mustela erminea fallenda

Original Description. Hall 1945: J. Mamm. 26:79.
Type Locality. Huntingdon, British Columbia.
Type Specimen. NMC 7096.
Range. Extreme northwestern Washington and the coastal lowlands and mountains of mainland British Columbia as far north as Powell River.

Mustela erminea haidarum

Original Description. Preble 1898: Proc. Biol. Soc. Wash. 12:169.
Type Locality. Masset, Graham Island, Queen Charlotte Islands, British Columbia.
Type Specimen. USNM 94430.
Range. An insular race restricted to Graham and Moresby islands, Queen Charlotte Islands.

Mustela erminea invicta

Original Description. Hall 1945: J. Mamm. 26:75.
Type Locality. Benewah, Benewah Co., Idaho.
Type Specimen. MVZ 101122.
Range. Alberta; northern Washington, Idaho and Montana; and southern British Columbia as far north as the Yellowhead Pass.

Mustela erminea richardsonii

Original Description. Bonaparte 1838: Charlesworth Mag. Nat. Hist. 2:38.
Type Locality. Fort Franklin, Northwest Territories.
Type Specimen. BMNH 43.3.3.4.
Range. Broadly distributed across northern Canada from Quebec to the Yukon Territory. It inhabits the entire northern and central mainland of the province.

Mustela frenata Lichtenstein, 1831

Long-tailed Weasel

M. frenata ranges from central Canada to northern South America. In British Columbia it occupies the southern and central mainland.

SYNONYMS. *Mustela longicauda*, *Mustela saturata*, *Putorius longicauda*, *Putorius saturata*.

OTHER COMMON NAMES. None.

SUBSPECIES. Subspecies were revised by Hall (1951) who recognized 21 North American races; 3 are found in the province. Patterns of size variation in North American populations were studied by Ralls and Harvey (1985), but they did not evaluate Hall's (1951) taxonomy.

Mustela frenata altifrontalis

Original Description. Hall 1936: Carnegie Instit. Wash. Publ. 473:94.
Type Locality. Tillamook, Tillamook Co., Oregon.
Type Specimen. MVZ 42093.
Range. A coastal race ranging from Oregon to the lower Fraser Valley of British Columbia.

Mustela frenata nevadensis

Original Description. Hall 1936: Carnegie Instit., Wash. Publ. 473:91.
Type Locality. 3 mi. (4.8 km) E of Baker, White Pine Co., Nevada.
Type Specimen. MVZ 41053.
Range. The western United States and south-central British Columbia from the coastal mountain ranges to Kootenay Lake.

Mustela frenata oribasus

Original Description. Bangs 1899: Proc. New England Zool. Club 1:81.
Type Locality. Summit between Kettle Creek and Cherry Creek, 7,500 ft. (2,288 m), British Columbia.
Type Specimen. MCZ B9058.
Range. Western Alberta, Montana and northwestern Wyoming. It inhabits the central dry interior and southern Rocky, Purcell, Selkirk, and Monashee mountains in British Columbia.

Mustela nivalis Linnaeus, 1776

Least Weasel

M. nivalis has a holarctic range across Eurasia, Alaska, Canada and the northern United States. In British Columbia it occurs in northern and central parts of the mainland.

SYNONYMS. *Mustela rixosa*, *Putorius rixosus*, *Putorius pusillus*, *Putorius vulgaris*.

OTHER COMMON NAMES. None.

SUBSPECIES. North American subspecies were revised by Hall (1951) who recognized four races; one occurs in the province. According to Ralls and Harvey (1985), *M. nivalis* demonstrates less size variation across its North American range than *M. erminea* or *M. frenata*.

Mustela nivalis rixosa

Original Description. Bangs 1896: Proc. Biol. Soc. Wash. 10:21.
Type Locality. Osler, Saskatchewan.
Type Specimen. MCZ B642.
Range. Northern Canada from Labrador to the Yukon Territory and the north-central United States. It occupies the northern and central mainland of the province as far south as Ootsa Lake and Vanderhoof.
Remarks. Youngman (1975) suggested that the race *M. nivalis eskimo* may occur in extreme northwestern British Columbia, but there are too few specimens available to assess the taxonomy of *M. nivalis* in this region.

Mustela vison Schreber, 1777

Mink

Distributed across most of the North American continent, *M. vison* inhabits the entire mainland of British Columbia and most coastal islands including Vancouver Island.

SYNONYMS. *Putorius vison*.

OTHER COMMON NAMES. None.

SUBSPECIES. Subspecies were first revised by Hollister (1913). Hall (1981) listed 15 subspecies; 2 occur in the province. Bährens (1960) found that cranial variation across much of North America is clinal and he concluded that some of the mainland races are weakly defined.

Mustela vison energumenos

Original Description. Bangs 1896: Proc. Boston Soc. Nat. Hist. 27:5.
Type Locality. Sumas, British Columbia.
Type Specimen. MCZ B3555.
Range. Most of western North America from Alaska to California and New Mexico. In British Columbia it is known from the entire mainland and adjacent coastal islands.
Remarks. According to Bährens (1960), this subspecies is weakly differentiated from other mainland races.

Mustela vison evagor

Original Description. Hall 1932: Univ. Calif. Publ. Zool. 38:418-419.
Type Locality. Little Qualicum River, Vancouver Island, British Columbia.
Type Specimen. MVZ 12479.
Range. An insular race restricted to Vancouver Island and adjacent islands.
Remarks. Bährens (1960) reported that this race is strongly differentiated in cranial morphology from mainland populations.

Genus *Spilogale*

The genus *Spilogale* was revised by van Gelder (1959). One species is currently recognized in North America.

Spilogale putorius Linnaeus, 1758

Spotted Skunk

S. putorius is distributed across the United States and Middle America. In Canada it is restricted to extreme southwestern British Columbia. Mead (1968) suggested that eastern and western populations of the Spotted Skunk are separate species, and Jones *et al.* (1986) classified these two forms as *S. gracilis* and *S. putorius*. However, van Gelder (1959) and Honacki *et al.* (1982) treated all populations as a single species: *S. putorius*.

SYNONYMS. *Spilogale gracilis*, *Spilogale olympica*, *Spilogale phenax latifrons*, *Viverra putorius*.

OTHER COMMON NAMES. Civet Cat.

SUBSPECIES. Van Gelder (1959) recognized 15 subspecies; 1 occurs in British Columbia.

Spilogale putorius latifrons

Original Description. Merriam 1890: N. Amer. Fauna 4:15.
Type Locality. Roseburg, Douglas Co., Oregon.
Type Specimen. USNM 17271/24200.
Range. A coastal race extending from Oregon to Garibaldi Provincial Park and the Sechelt Peninsula in British Columbia.

Genus *Taxidea*

One species is recognized in this North American genus.

Taxidea taxus (Schreber, 1778)

Badger

T. taxus is widely distributed across central and western regions of Canada, and the United States and northern Mexico. It is restricted to the southern interior of British Columbia.

SYNONYMS. *Meles jeffersonii*, *Taxidea americana neglecta*, *Taxidea sulcata*, *Taxidea taxus montana*, *Taxidea taxus neglecta*.

OTHER COMMON NAMES. Yellow Badger.

SUBSPECIES. According to Long (1972), there are four subspecies; one occurs in the province.

Taxidea taxus jeffersonii

Original Description. Harlan 1825: Fauna Americana: 309.
Type Locality. Open plains of the Columbia [River].
Type Specimen. None designated.
Range. The western United States and British Columbia where it occupies the central and southern interior as far north as Williams Lake.

Family Otariidae — Eared Seals

Genus *Callorhinus*

There is one species in the genus.

Callorhinus ursinus (Linnaeus, 1758)

Northern Fur Seal

Linnaeus, 1758. Syst. Nat. 10.1:37. Type Locality, North Pacific Ocean. Type Specimen, none designated.

C. ursinus inhabits the North Pacific Ocean. During summer, most individuals are found on breeding rookeries on isolated islands in the Bering and Okhotsk seas. In autumn, animals leave the rookeries and migrate south. Breeding rookeries in the eastern Pacific are confined to the Pribilof Islands of Alaska. Animals from the Pribilofs migrate as far south as California in winter; some *C. ursinus* also overwinter in British Columbia waters (Spalding 1964).

SYNONYMS. *Arctocephalus californianus*, *Callorhinus alascanus*, *Callorhinus ursina*, *Callotaria alascana*, *Phoca ursina*.

OTHER COMMON NAMES. Alaska Fur Seal.

SUBSPECIES. No subspecies are recognized (Scheffer 1958). Taylor *et al.* (1955) suggested that western and eastern Pacific populations were indistinguishable, but there has been no detailed comparison of these populations.

Genus *Eumetopias*

There is one species in the genus.

Eumetopias jubatus (Schreber, 1776)

Northern Sea Lion

Schreber, 1776. Die Saugthiere ..., theil 3, heft 17, p. 300. Type Locality, North Pacific Ocean. Type Specimen, not known to exist.

An inhabitant of the North Pacific Ocean, *E. jubatus* ranges from the Okhotsk Sea and Kuril Islands through the Aleutian Islands and Bering Sea and south along the North American coast to California. Some 51 separate breeding rookeries exist within this range (Loughlin *et al.* 1984). Breeding rookeries in British Columbia are confined to the Scott Islands, Cape St. James and North Danger Rocks; haulout sites are scattered over the entire coast (Bigg 1985).

SYNONYMS. *Arctocephalus monteriensis*, *Eumetopias jubata*, *Eumetopias stelleri*, *Otaria stelleri*, *Phoca jubata*.

OTHER COMMON NAMES. Steller Sea Lion.

SUBSPECIES. No subspecies are recognized (Scheffer 1958). Bigg (1985) suggested that each breeding rookery may be a separate breeding stock. However, there has been no study of geographic variation in the province or across the entire range.

Genus *Zalophus*

There is one species in the genus.

Zalophus californianus (Lesson, 1828)

California Sea Lion

Z. californianus is restricted to the Pacific Ocean where there are three geographically isolated populations: the Sea of Japan, west coast of North America and the Galapagos Islands. The North American populations range from Mexico to British Columbia; breeding rookeries are confined to California and Mexico but, in winter, males migrate as far north as British Columbia. Distribution and movements in the province were reviewed by Bigg (1985).

SYNONYMS. *Otaria californiana*.

OTHER COMMON NAMES. None.

SUBSPECIES. The three populations are classified as separate subspecies (Scheffer 1958). Orr *et al.* (1970) assessed skull morphology in samples from California, the Gulf of California (Mexico) and the Galapagos Islands. However, a comprehensive study of geographic variation is needed.

Zalophus californianus californianus

Original Description. Lesson 1828: Dictionaire classique d'histoire naturelle 13:420.
Type Locality. San Francisco Bay, California.
Type Specimen. None designated.
Range. The west coast of North America from Mexico to British Columbia.

Family Phocidae — Hair Seals

Genus *Mirounga*

Two species are recognized in the genus; one occurs in the province.

Mirounga angustirostris (Gill, 1866)

Northern Elephant Seal

Gill, 1866. Proc. Chicago Acad. Sci. vol. 1, p. 33. Type Locality, St. Bartholomew's Bay, Lower California, Mexico. Type Specimen, none designated.

M. angustirostris is restricted to the eastern North Pacific Ocean. Breeding rookeries are confined to Baja California, Mexico and California; however, feeding areas extend as far north as British Columbia. According to Condit and LeBoeuf (1984), *M. angustirostris* in British Columbia waters originate from breeding rookeries off central California.

SYNONYMS. *Macrorhinus angustirostris*.

OTHER COMMON NAMES. None.

SUBSPECIES. No subspecies are recognized (Scheffer 1958) and there is evidently no genetic variation in *M. angustirostris* (Bonnell and Selander 1974).

Genus *Phoca*

The genus was revised by Doutt (1942) and Scheffer (1958). There is still controversy about the limits of the genus and the number of valid species. Honacki *et al.* (1982) recognized seven species; one occurs in the province.

Phoca vitulina Linnaeus, 1758

Harbor Seal

P. vitulina has a vast range throughout coastal areas of the North Pacific, Arctic and North Atlantic oceans. It inhabits the entire British Columbia coast. Systematics of North Pacific Harbor Seals has been controversial. Shaughnessy and Fay (1977) and Burns *et al.* (1984) demonstrated that there are two sibling species in this region: *P. largha*, a species associated with the pack ice, and *P. vitulina*, a species that inhabits islands and coastal areas.

SYNONYMS. *Halichoerus antarticus*, *Halicyon richardii*, *Halicyon richardsi*, *Phoca richardii*, *Phoca richardii pribilofensis*, *Phoca richardsi*, *Phoca vitulina richardi*.

OTHER COMMON NAMES. None.

SUBSPECIES. Subspecies were first revised by Doutt (1942), but his taxonomy was modified by Shaughnessy and Fay (1977) and Burns *et al.* (1984) who assessed geographic variation in North Pacific populations. Five subspecies are currently recognized; one occurs in the province.

Phoca vitulina richardsi

Original Description. Gray 1864: Proc. Zool. Soc. London:27.
Type Locality. Queen Charlotte Sound, northern end of Vancouver Island, British Columbia.
Type Specimen. BMNH 1864.2.19.1 (see Shaughnessy and Fay 1977).
Range. Coastal areas of the eastern Pacific from the eastern Aleutian Islands to California.
Remarks. Taxonomic affinities between the eastern Pacific (*P. v. richardsi*) and western Pacific (*P. v. stejnegeri*) forms of the Harbor Seal are still not clear. Although Burns *et al.* (1984) treated them as separate races, they noted that additional specimens are needed. The eastern and western subspecies may be part of a broad cline across the North Pacific.

Family Procyonidae — Procyonids

Genus *Procyon*

The genus was revised by Goldman (1950). There are two North American species; one occurs in British Columbia.

Procyon lotor (Linnaeus, 1758)

Raccoon

Widely distributed across North and Middle America, *P. lotor* is known from the extreme southern interior, coastal areas as far north as Kingcome Inlet, and Vancouver Island and adjacent islands. Populations were introduced to the Queen Charlotte Islands in the 1940s.

SYNONYMS. *Procyon proteus*, *Procyon psora pacifica*, *Ursus lotor*.

OTHER COMMON NAMES. None.

SUBSPECIES. Subspecies were revised by Goldman (1950); however, *P. lotor* and other species of the genus are in need of a modern study. About 22 North American subspecies are recognized; 2 are found in the province.

Procyon lotor pacificus

Original Description. Merriam 1899: N. Amer. Fauna 16:107.
Type Locality. Lake Keechelus, 8,000 ft., Kittitas Co., Washington.
Type Specimen. USNM 93137.
Range. Washington, Oregon and southern British Columbia.

Procyon lotor vancouverensis

Original Description. Nelson and Goldman 1930: J. Mamm. 11:458.
Type Locality. Quatsino Sound, Vancouver Island, British Columbia.
Type Specimen. USNM 135457.
Range. An insular race restricted to Vancouver Island and adjacent islands.
Remarks. Raccoons from Vancouver Island were introduced to the Queen Charlotte Islands but the distribution and morphometrics of this introduced population have not been studied.

Family Ursidae — Bears

Genus *Ursus*

Three species occur in North America; two are found in the province.

Ursus americanus Pallas, 1780

Black Bear

U. americanus is found throughout most of the North American continent. In British Columbia, it inhabits the entire mainland, larger adjacent islands, Vancouver Island and the Queen Charlotte Islands.

SYNONYMS. *Euarctos altifrontalis*, *Euarctos americanus*, *Euarctos carlottae*, *Euarctos cinnamomum*, *Euarctos kermodei*, *Ursus altifrontalis*, *Ursus carlottae*, *Ursus cinnamomum*, *Ursus kermodei*.

OTHER COMMON NAMES. Cinnamon bear, Glacier bear, Kermode bear.

SUBSPECIES. Systematics of *Ursus americanus* from western North America, particularly the Pacific Northwest, have been hindered by the existence of distinct black, brown, white and blue colour morphs (Hall 1928; Cowan 1938). Anderson (1945) reviewed western subspecies, but there has been no recent study of geographic variation. Hall (1981) listed 16 subspecies for North America, but the validity of some of these is questionable. According to Hall (1981), five subspecies occur in the province. Another race, the blue or glacier bear (*U. americanus emmonsii*) of southeastern Alaska, could inhabit the extreme northwestern corner of the province, but this has yet to be verified by specimens (Cowan and Guiguet 1965).

Ursus americanus altifrontalis

Original Description. Elliot 1903: Field Columb. Mus. Pub. 80 Zool. ser. 3:234.
Type Locality. Lake Crescent, Olympic Mountains, Clallam Co., Washington.
Type Specimen. FMNH 7053.
Range. A coastal race that ranges from Oregon to Bella Coola and Tweedsmuir Provincial Park.

Ursus americanus carlottae

Original Description. Osgood 1901: N. Amer. Fauna 21:30.
Type Locality. Masset, Graham Island, Queen Charlotte Islands, British Columbia.
Type Specimen. USNM 87620.
Range. An insular race restricted to the Queen Charlotte Islands.

Ursus americanus cinnamomum

Original Description. Audubon and Bachman 1854: Quad. N. Amer. 3:125.
Type Locality. Northern Rocky Mountains.
Type Specimen. None designated.
Range. Alberta, Montana, Wyoming, Idaho, eastern Washington and Oregon, and most of mainland of British Columbia east of the coastal mountain ranges.

Ursus americanus kermodei

Original Description. Hornaday 1905: Ninth Ann. Rept. N.Y. Zool. Soc. (1904): 82.
Type Locality. Gribble (= Gribbell) Island, British Columbia.
Type Specimen. RBCM 1369.
Range. Restricted to the coastal mainland of British Columbia where it ranges from the Burke Channel to the Nass River and some adjacent coastal islands (Princess Royal, Pitt, Gribbell).
Remarks. This name was originally applied to the white colour morph; however, the race *kermodei* now applies to both white and black morphs (Hall 1928; Cowan and Guiguet 1965).

Ursus americanus vancouveri

Original Description. Hall 1928: Univ. Calif. Publ. Zool. 30:231.
Type Locality. King Solomon Basin, Vancouver Island, British Columbia.
Type Specimen. MVZ 12461.
Range. An insular race restricted to Vancouver Island and larger adjacent islands.

Ursus arctos Linnaeus, 1758

Grizzly Bear

Historically, *U. arctos* had a vast distribution across Eurasia and North America. However, it has been extirpated from much of its range. In British Columbia, it inhabits most of the mainland but is absent from the coastal islands. Taxonomy and nomenclature of the grizzly-brown bears has long

been confusing, primarily because of the revision by Merriam (1918). Based on small samples and little appreciation of variation, some 80 North American species including 14 for British Columbia were proposed by Merriam (1918). The brown-grizzly bears of Eurasia and North America are now considered to be a single variable species *Ursus arctos* (Rausch 1953; Kurtén 1973b). However, the classification of Merriam (1918) left a bewildering number of synonyms in the published literature.

SYNONYMS. *Ursus atnarko, Ursus ausorgus, Ursus chelidonias, Ursus crassodon, Ursus hoots, Ursus horribilis, Ursus kluane impiger, Ursus kwakiutl, Ursus kwakiutl warburtoni, Ursus ophrus, Ursus oribasus, Ursus pervagor, Ursus pulchellus ereunetes, Ursus selkirki, Ursus shoshone canadensis, Ursus stikeenensis, Ursus tahltanicus.*

OTHER COMMON NAMES. Brown Bear, Silver Tip.

SUBSPECIES. One of the first attempts to bring order to the multitude of names proposed for North American *U. arctos* was by Rausch (1953). Later, Rausch (1963) conducted a detailed study of size variation across the North American range and demonstrated that most of the variation was clinal with the largest *U. arctos* inhabiting the Alaska Peninsula. He concluded that extant populations of North American *U. arctos* should be classified into two races: *U. arctos middendorffi* from Kodiak, Afognak and Shuyak islands in Alaska, and *U. arctos horribilis* encompassing all other populations including those from the Alaska Peninsula. In a recent revision of North America *U. arctos*, Hall (1984) recognized nine subspecies with two (*horribilis, stikeenensis*) occurring in the province. This study provides a valuable list of synonyms for the various names of North American *U. arctos*, but the nine races are suspect. No evidence was presented by Hall (1984) to demonstrate the existence of nine distinct taxa; moreover, some of the boundaries between these taxa make little biological sense.

Ursus arctos horribilis

Original Description. Ord 1815: *In* Guthrie, A new geog., hist., comb. grammer..., Philadelphia, 2nd ed. 2:291.

Type Locality. Missouri River, Montana.

Type Specimen. None designated.

Range. A large distribution from northern Mexico to the Yukon Territory in western North America.

Remarks. According to Rausch (1963), all the extant North American populations of *U. arctos* except for those on Kodiak, Afognak and Shuyak islands belong to this race.

Order Cetacea — Whales

Family Balaenidae — Right Whales

Genus *Balaena*

Systematics of the genus have been contentious and several taxonomic and nomenclatural problems need to be resolved. Honacki *et al.* (1982) and Jones *et al.* (1986) recognized two species in the genus: the right whale *Balaena glacialis* and the bowhead whale *Balaena mysticetus*. Other authorities (Hershkovitz 1966; Reeves and Brownell 1982; Schevill 1986) treat the right whale as a separate genus: *Eubalaena*. One species is known from British Columbia waters.

Balaena glacialis Muller, 1776

Right Whale

An inhabitant of all the world's oceans except for equatorial waters, *B. glacialis* is migratory, moving to subpolar waters in summer and returning to temperate regions in winter. Historically, summer feeding areas in the northeastern Pacific were concentrated in the Bering Sea and the Gulf of Alaska, although its summer range extended as far south as 50°N in British Columbia waters. Its winter range in the eastern Pacific extended from Washington to northern California (Reeves and Brownell 1982); Pike and MacAskie (1969) reported that it also occurred off British Columbia in winter. Populations have been reduced or extirpated throughout much of its historical range.

North Pacific, North Atlantic and southern hemisphere populations are probably isolated with little mixing. Taxonomic affinities between these three groups of populations is still unresolved. Although the southern hemisphere form has been considered a distinct species (*B. australis*) by some authors, most taxonomists regard the three groups as a single species: *B. glacialis*. Because few comparative specimens are available, a detailed taxonomic study is not possible.

SYNONYMS. *Balaena japonica*, *Eubalaena glacialis*, *Eubalaena glacialis japonica*, *Eubalaena glacialis sieboldii*, *Eubalaena sieboldii*.

OTHER COMMON NAMES. Black Right Whale, Pacific Right Whale.

SUBSPECIES. Three subspecies representing North Pacific, North Atlantic and southern hemisphere populations are recognized by most authorities (e.g., Hershkovitz 1966). Omura *et al.* (1969), however, found little differentiation between North Atlantic and North Pacific populations. The validity of these races is in need of more study.

Balaena glacialis japonica

Original Description. Lacépède 1818: Mem. Mus. Hist. Nat., Paris, 4:469.
Type Locality. Japan.
Type Specimen. None designated.
Range. Eastern and western North Pacific Ocean. In the eastern North Pacific it ranges from Alaska to northern California.

Family Balaenopteridae — Rorquals

Genus *Balaenoptera*

There are five species in the genus; four are found in British Columbia waters.

Balaenoptera acutorostrata Lacépède, 1804

Minke Whale

B. acutorostrata inhabits all the world's oceans; it is generally absent from equatorial waters. Usually, it migrates to high latitudes in spring and summer and returns to lower latitudes in winter, but in some regions it is present throughout the year. In the northeastern Pacific it ranges from the

Chukchi Sea south to Baja California. Although *B. acutorostrata* is most common in British Columbia waters in spring and summer, there is evidence of year-round populations in Puget Sound and around the San Juan Islands (Stewart and Leatherwood 1985).

Minke Whales were originally treated as several distinct species, but most taxonomists now classify them as a single species *B. acutorostrata*. Nonetheless, taxonomic relationships between North Pacific, North Atlantic and southern hemisphere populations still are unclear.

SYNONYMS. *Balaenoptera bonaerensis*, *Balaenoptera davidsoni*, *Balaenoptera huttoni*, *Balaenoptera rostrata*.

OTHER COMMON NAMES. Davidson's Whale, Piked Whale, Sharpheaded Finner Whale.

SUBSPECIES. Three subspecies are recognized representing North Pacific, North Atlantic and southern hemisphere populations. Although colour and morphological differences exist among these races (Cowan 1939; Stewart and Leatherwood 1985), a comprehensive study of variation throughout the range is needed to resolve their taxonomy. Based largely on distributional data, the International Whaling Commission recognizes three distinct stocks in the North Pacific (eastern, central and western Pacific).

Balaenoptera acutorostrata davidsoni

Original Description. Scammon 1872: Proc. Calif. Acad. Sci. 4:269.
Type Locality. Admiralty Inlet, Puget Sound, Washington.
Type Specimen. USNM 12177.
Range. The North Pacific Ocean. In the eastern North Pacific it ranges from the Bering Sea to Baja California.

Balaenoptera borealis Lesson, 1828

Sei Whale

A cosmopolitan species, *B. borealis* migrates to high latitudes to feed in summer and returns to temperate waters to winter. In the eastern North Pacific, its summer range extends from California to the Gulf of Alaska; in winter, populations are concentrated off southern California and Mexico. In British Columbia waters, *B. borealis* concentrates off the west coast of Vancouver Island in summer (Pike and MacAskie 1969).

SYNONYMS. *Balaena rostrata*, *Balaenoptera arctica*, *Balaenoptera laticeps*.

OTHER COMMON NAMES. Pollack Whale, Japan Finner.

SUBSPECIES. Northern and southern hemisphere populations are classified as separate subspecies. The two races differ in size but there has been no modern study of variation in this species. Based on distributional data and baleen plate morphology, Masaki (1977) proposed distinct eastern, central and western stocks for the North Pacific.

Balaenoptera borealis borealis

Original Description. Lesson 1828: Histoire naturelle... des mammiferes et des oiseaux decouverts depuis 1778, ctac p. 342.
Type Locality. Gromitz, Germany.
Type Specimen. None designated.
Range. North Pacific and North Atlantic oceans.

Balaenoptera musculus (Linnaeus, 1758)

Blue Whale

This whale inhabits all the world's oceans. It migrates poleward to summer feeding grounds and returns to subtropical and tropical waters in winter. In the northeastern Pacific, *B. musculus* are concentrated in summer off the Aleutian Islands, in the Gulf of Alaska and off the Queen Charlotte Islands; main winter sites in the northeastern Pacific are off southern California and Baja California.

SYNONYMS. *Balaena musculus*, *Balaenoptera sibbaldi*, *Sibbaldius musculus*, *Sibbaldus musculus*.

OTHER COMMON NAMES. Blue Rorqual, Sulphur-bottom Whale.

SUBSPECIES. Three subspecies are recognized: one inhabits the northern hemisphere, two inhabit the southern hemisphere. The number of stocks in the North Pacific Ocean is not clear but recoveries of tagged individuals suggest that there may be considerable movement between the eastern and western Pacific (Yochem and Leatherwood 1985).

Balaenoptera musculus musculus

Original Description. Linnaeus 1758. Syst. nat., ed. 10,1:76.
Type Locality. Firth of Forth, Scotland.
Type Specimen. Not known to exist.
Range. The North Atlantic and North Pacific oceans.

Balaenoptera physalus (Linnaeus, 1758)

Fin Whale

Found throughout the world's oceans, *B. physalus* migrates to high latitudes in summer and returns to lower latitudes in winter. Its summer range in the eastern North Pacific extends from the Aleutian Islands south to California; in winter, it ranges from California south to 20°N latitude. Both migrants and summer residents occur in British Columbia waters (Pike and MacAskie 1969).

SYNONYMS. *Balaena physalus*, *Balaenoptera velifera*.

OTHER COMMON NAMES. Common Finback Whale, Common Rorqual, Finback Whale, Herring Whale.

SUBSPECIES. Two subspecies, representing populations from the northern and southern hemispheres, are recognized. However, there has been no modern study assessing the validity of these races. Morphometric, biochemical and distributional data (Ichihara 1957; Fujino 1960) suggest that there are distinct eastern Pacific, western Pacific and China Sea stocks in the North Pacific. Some mixing between eastern and western stocks occurs in waters off the Aleutian Islands.

Balaenoptera physalus physalus

Original Description. Linnaeus 1758. Syst. nat., ed. 10,1:75.
Type Locality. Spitzbergen Seas.
Type Specimen. Not known to exist.
Range. North Atlantic and North Pacific Oceans.

Genus Megaptera

One species is recognized in the genus.

Megaptera novaeangliae (Borowski, 1781)

Humpback Whale

Borowski, 1781. Gemeinnuzzige Naturgeschichte des Thierreiches Berlin 2(1):21. Type Locality, coast of New England, United States. Type Specimen, not known to exist.

M. novaeangliae inhabits all the world's oceans. It demonstrates the pattern, typical for baleen whales, of migrating from subtropical and tropical winter grounds to polar regions in summer. Its summer range in the North Pacific Ocean extends from California through the Aleutian Islands to Japan. However, most *M. novaeangliae* are concentrated at several sites in the summer: the Bering Sea and the eastern Aleutians, Prince William Sound, and the Alexander Archipelago off Alaska. There are three major winter sites in the North Pacific: a western Pacific site, a central Pacific site at the Hawaiian Islands and an eastern site off Baja California and Mexico (Darling and McSweeney 1985).

SYNONYMS. *Megaptera nodosa*, *Megaptera versabilis*.

OTHER COMMON NAMES. None.

SUBSPECIES. No subspecies are recognized. The number of stocks in the North Pacific is still unclear. From a study of colour patterns on flippers, Herman and Antinoja (1977) concluded that the Hawaiian population is a distinct stock. However, migration patterns (Darling and McSweeney 1985) and similarities in vocalizations (Payne and Guinee 1983) suggest that *M. novaeangliae* from the central and eastern Pacific winter sites belong to a single stock. The extent that these whales mix with western Pacific *M. novaeangliae* is not known, but there is some overlap in the summer ranges of these populations (Darling and McSweeney 1985).

Family Delphinidae — Delphinids

Genus *Delphinus*

Two species are recognized in the genus; one may occur in British Columbia waters. Systematic relationships among some members of the genus are controversial and the number of valid species is still unresolved.

Delphinus delphis Linnaeus, 1758

Saddle-backed Dolphin

Linnaeus, 1758. Syst. Nat. ed. 10,1:77. Type Locality, "Oceano Europae". Type Specimen, not known to exist.

D. delphis is cosmopolitan in its distribution, occupying temperate and tropical waters. In the northeastern Pacific Ocean, it ranges from the equator to central California. Its occurrence in British Columbia waters is based on a single specimen that washed ashore at Victoria, Vancouver Island in 1953 (Guiguet 1954).

Taxonomy of the Saddle-backed Dolphin is complex. North Pacific populations were originally classified as either a distinct species, *Delphinus bairdii*, or a subspecies of *D. delphis* (*D. delphis bairdii*) (Hershkovitz 1966). From an analysis of skull morphology in specimens from California, Banks and Brownell (1969) demonstrated that there are distinct long-snouted and short-snouted morphs in the eastern Pacific. They considered them to be separate species, with the long-snouted dolphin classified as *D. bairdii* and the short-snouted one as *D. delphis*. Although their conclusions were criticized by van Bree and Purves (1972), Evans (1982) also demonstrated the existence of two morphs on the west coast of North America. Taxonomy of the saddle-backed dolphin is in need of further study.

SYNONYMS. *Delphinus bairdii*, *Delphinus capensis*, *Delphinus delphis bairdii*.

OTHER COMMON NAMES. Baird's Dolphin, Common Dolphin, White-bellied Porpoise.

SUBSPECIES. Hershkovitz (1966) proposed three subspecies with one, *D. delphis bairdii*, inhabiting the North Pacific. However, the existence of two distinct morphs in the eastern North Pacific (Banks and Brownell 1969; Evans 1982) indicates that this taxonomy is simplistic.

Genus *Globicephala*

There are two species in the genus; one is found in British Columbia waters. The genus was revised by van Bree (1971).

Globicephala macrorhynchus Gray, 1846

Short-finned Pilot Whale

Gray, 1846. Zoology of the voyage of the H.M.S. Erebus and Terror. 1(Mammalia):32. Type Locality, near Nagasaki, Japan. Type Specimen, Leiden Museum.

G. macrorhynchus inhabits tropical and warm temperate waters of the North and South Pacific, North Atlantic and Indian oceans. It ranges as far north as Japan in the western North Pacific and the Gulf of Alaska in the eastern Pacific. Most records for British Columbia are from offshore waters (Pike and MacAskie 1969).

SYNONYMS. *Globicephala macrorhyncha*, *Globicephala scammonii*, *Globicephala sieboldii*.

OTHER COMMON NAMES. Blackfish, Pacific Pilot Whale.

SUBSPECIES. No subspecies are currently recognized. Gaskin (1982) suggested that the North Pacific form may be a distinct subspecies, but according to Mitchell (1975), there are two forms of *G. macrorhynchus* in the North Pacific. One resembles *G. macrorhynchus* from the North Atlantic; the other morph is larger and has a different shaped head. A comprehensive study is needed to resolve the taxonomy of North Pacific populations.

Genus *Grampus*

One species is recognized in the genus.

Grampus griseus (G. Cuvier, 1812)

Risso's Dolphin

Cuvier, 1812. Ann. Mus. Nat. Hist., Paris 19:13-14. Type Locality, Brest, France. Type Specimen, Museum National d'Histoire Naturelle, Paris.

G. griseus inhabits tropical and temperate waters throughout the world. In the eastern North Pacific it has been recorded as far north as the Gulf of Alaska although it is uncommon in British Columbia and Alaskan waters (Braham 1983).

SYNONYMS. *Delphinus griseus*, *Grampus richardsonii*.

OTHER COMMON NAMES. Gray Grampus, White-headed Grampus.

SUBSPECIES. No subspecies are recognized. It is unknown if distinct stocks exist. However, Ross (1984) found no significant morphological differences in *G. griseus* specimens from the North Atlantic, North Pacific and South African waters.

Genus *Lagenorhynchus*

There are six species in the genus; one occurs in British Columbia waters. A general overview of the genus was given by Fraser (1966).

Lagenorhynchus obliquidens Gill, 1865

Pacific White-sided Dolphin

Gill, 1865. Proc. Acad. Nat. Sci. Phil. 17:177. Type Locality, near San Francisco, California, United States. Type Specimen, USNM 1961, 1962, 1963.

Restricted to the North Pacific Ocean, *L. obliquidens* has a continuous range from about 20°N to 60°N latitude. It is found in offshore and coastal waters of British Columbia.

SYNONYMS. *Delphinus longidens*, *Lagenorhynchus ognevi*.

OTHER COMMON NAMES. Pacific Striped Dolphin, Hookfin Dolphin.

SUBSPECIES. No subspecies are recognized; however, there has been no study of geographic variation. Mitchell (1975) speculated that there may be separate eastern and western North Pacific stocks, but distributional data summarized by Leatherwood *et al.* (1984) suggests that eastern and western Pacific populations are continuous.

Genus *Lissodelphis*

There are two species in the genus: a North Pacific species and a southern hemisphere species.

Lissodelphis borealis (Peale, 1848)

Northern Right-whale Dolphin

Peale, 1848. In U.S. Exploring Expeditions, 8(Mammalogy and Ornithology):35. Type Locality, North Pacific Ocean. Type Specimen, none designated.

This dolphin is restricted to the North Pacific Ocean. In the eastern North Pacific it ranges from Baja California to British Columbia (50°N latitude) where it generally inhabits offshore waters. It is known in British Columbia from sightings (Pike and MacAskie 1969) and a specimen record off the west coast of Vancouver Island.

SYNONYMS. *Delphinapterus borealis*, *Tursio borealis*.

OTHER COMMON NAMES. None.

SUBSPECIES. No subspecies are recognized, but there has been no study of geographic variation in this species. According to Mitchell (1975), no stocks have been identified.

Genus *Orcinus*

One species is recognized in the genus.

Orcinus orca (Linnaeus, 1758)

Killer Whale

Linnaeus, 1758. Syst. Nat. ed. 10,1:77. Type Locality, "Oceano Europaeo". Type Specimen, none designated.

O. orca is cosmopolitan, inhabiting all the world's oceans. It is found throughout the coastal waters of British Columbia. Although most taxonomists recognize one species in the genus, Berzin and Vladimirov (1983) described a second species, *O. glacialis*, from Antarctica, which differs from *O. orca* in size, colour patterns and ecology. More research is needed to determine if *glacialis* represents a subspecies of *O. orca* or a separate species as proposed by Berzin and Vladimirov (1983).

SYNONYMS. *Grampus orca*, *Grampus rectipinna*, *Orcinus rectipinna*.

OTHER COMMON NAMES. Blackfish, Orca.

SUBSPECIES. No subspecies are recognized. Evans *et al.* (1982) described geographic variation in colour markings of *O. orca* from different oceans. However, their data were inadequate to determine if there are distinct regional morphs. In a detailed study of *O. orca* from British Columbia waters, Bigg (1982) found distinct transient and resident pods. Individuals from these two kinds of pods differ in external morphology and behaviour (Bigg 1982; Baird and Stacey 1988) with some parallels to the *glacialis* and *orca* forms described from Antarctica. Transient and resident *O. orcinus* are differentiated as well in their mitochondrial DNA (Stevens *et al.* 1989). At present, the taxonomic status of transient and resident pods is unknown.

Genus *Pseudorca*

There is one species in the genus.

Pseudorca crassidens (Owen, 1846)

False Killer Whale

Owen, 1846. A history of British fossil mammals and birds, p. 516. Type Locality, Lincolnshire Fens, near Stanford, England. Type Specimen, Museum of Stamford Institutions.

P. crassidens inhabits tropical and temperate waters of all oceans. In the North Pacific it usually ranges as far north as California; however, in 1987 it was seen in Puget Sound, and a dead animal stranded on Denman Island, British Columbia, was the first record for Canada (Baird *et al.* 1989).

SYNONYMS. *Phocgena crassidens*.

OTHER COMMON NAMES. None.

SUBSPECIES. No subspecies are recognized; it is unknown if distinct stocks exist.

Genus *Stenella*

The genus was revised in part by Perrin (1975a, 1975b). He recognized five species; one is found in British Columbia waters. However, systematics of the genus is complex and the species limits are unclear. As well, geographic variation is pronounced in several species, and distinct races that differ in body form and colour patterns have been described.

Stenella coeruleoalba (Meyen, 1833)

Striped Dolphin

Meyen, 1833. Nova Acta Acad. Cesareae Nat. Curios. 16(2):609-610. Type Locality, in vicinity of Rio Plata, east coast of South America. Type Specimen, Zoological Museum, Berlin.

S. coeruleoalba is worldwide in its distribution inhabiting temperate and tropical waters. In the eastern North Pacific, it ranges from the equator to British Columbia (Perrin 1975a). Several species of striped dolphins were described on the basis of colour patterns, but Fraser and Noble (1970) concluded that these colour variants represent a single species.

SYNONYMS. *Delphinus coeruleo-alba*, *Delphinus euphrosyne*, *Delphinus styx*, *Stenella euphrosyne*, *Stenella styx*.

OTHER COMMON NAMES. Euphrosyne Dolphin, Long-beaked Dolphin, Streaker Porpoise.

SUBSPECIES. No subspecies are recognized. Perrin (1975b) speculated that distinct geographic races probably exist in *S. coeruleoalba*, but there has been no comprehensive study of geographic variation.

Family Eschrichtidae — Gray Whales

Genus *Eschrichtius*

There is one species in the genus.

Eschrichtius robustus (Lilljeborg, 1861)

Gray Whale

Lilljeborg, 1861. Forh. Skand. Natur f. Ottende Mode, Kopenhagen (1860)8:602. Type Locality, Coast of New England. Type Specimen, none designated.

E. robustus is now restricted to the North Pacific Ocean; populations in the North Atlantic were extinct by the 1700s. It is a migratory species. In the eastern North Pacific it winters off southern California, the Baja Peninsula and the Mexican mainland; its main summer feeding grounds are in the Bering and Chukchi seas. *E. robustus* is concentrated in British Columbia waters during the spring and autumn migrations. A small resident population inhabits the west coast of Vancouver Island in summer (Darling 1984).

According to Hall (1981), the name, *E. gibbosus*, takes priority over *E. robustus*; however, Honacki *et al.* (1982) and Barnes and McLeod (1984) advocated the name *E. robustus* for this taxon.

SYNONYMS. *Agaphelus glaucus*, *Eschrictius gibbosus*, *Eschrichtius glaucus*, *Rhachianectes glaucus*.

OTHER COMMON NAMES. None.

SUBSPECIES. No subspecies are recognized. Two stocks exist in the Pacific Ocean: an eastern Pacific stock and a western Pacific stock that is near extinction.

Family Phocoenidae — Porpoises

Genus — *Phocoena*

There are four species in the genus; one is found in British Columbia waters. An overview of the genus was given by Norris and McFarland (1958).

Phocoena phocoena (Linnaeus, 1758)

Harbor Porpoise

Linnaeus, 1758. Syst. Nat. ed. 10,1:77. Type Locality, "Oceano Europaeo Balthico". Type Specimen, not known to exist.

P. phocoena is associated with the coastal waters of the North Pacific and North Atlantic oceans. It is widely distributed throughout British Columbia waters.

SYNONYMS. *Delphinus phocoena*, *Phocoena vomerina*.

OTHER COMMON NAMES. None.

SUBSPECIES. No subspecies are recognized, but Yurick (1977) and Yurick and Gaskin (1987) demonstrated that North Pacific and North Atlantic populations are strongly differentiated in skull morphology and dentition. Although three subpopulations were proposed for the northeastern Pacific, Yurick (1977) concluded that there were inadequate specimens to critically assess subpopulations in this region.

Genus *Phocoenoides*

There is one species in the genus.

Phocoenoides dalli (True, 1885)

Dall's Porpoise

True, 1885. Proc. U.S. Nat. Mus. 8:95. Type Locality, Strait west of Adakh (= Adak), Aleutian Islands, Alaska. Type Specimen, USNM 21762.

Restricted to the North Pacific Ocean, *P. dalli* ranges from Japan and the Bering Sea south to California. It is widely distributed in the coastal waters of British Columbia. The taxonomy of this porpoise has been problematic. There are two distinct colour types: the *dalli* morph and *truei* morph. The two morphs are geographically segregated throughout most of the range, with the *dalli* morph occupying the eastern Pacific and Bering Sea and the *truei* morph restricted to waters off Japan. Mixed schools composed of both colour types are found off northeastern Japan (Miyazaki *et al.* 1984). Andrews (1911) treated the two colour types as separate species, but most taxonomists regard them as either subspecies or colour phases of a single species.

SYNONYMS. *Phocoenoides truei*.

OTHER COMMON NAMES. White flank Porpoise, Spray Porpoise.

SUBSPECIES. There is still disagreement on the taxonomic status of the *truei* and *dalli* forms. One view is that they are separate geographic races or subspecies (e.g., Morejohn 1979); an alternate view is that they are simply colour phases from colour polymorphism (e.g., Houck 1976). More study is needed to assess morphological differences in the two morphs and the amount of interbreeding in mixed schools.

Family Physeteridae — Sperm Whales

Genus *Kogia*

Two species are recognized in the genus; one occurs in British Columbia waters. The genus was revised by Handley (1966).

Kogia simus (Owen, 1866)

Dwarf Sperm Whale

Owen, 1866. Trans. Zool. Soc. London 6(1):30. Type Locality, Waltair, near Vishaknaptnam, India. Type Specimen, BMNM 1474c-73.6.25.2.

K. simus is known from temperate and tropical waters of the Pacific, Atlantic and Indian oceans. In the eastern North Pacific, there are strandings from Mexico to British Columbia where its occurrence is based on a single stranding at Bamfield, Vancouver Island, in 1981 (Nagorsen and Stewart 1983).

SYNONYMS. *Physeter simus*.

OTHER COMMON NAMES. None.

SUBSPECIES. No subspecies are recognized; it is unknown if there are distinct stocks.

Genus *Physeter*

There is one species in the genus.

Physeter macrocephalus Linnaeus, 1758

Sperm Whale

Linnaeus, 1758. Syst. Nat. ed. 10, 1:76. Type Locality, "Oceano septentrionali". Type Specimen, not known to exist.

P. macrocephalus inhabits all the world's oceans. It is a migratory species, moving to higher latitudes in summer and lower latitudes in winter. During summer in the eastern North Pacific, males range as far north as the Bering Sea; females are restricted to lower latitudes where they range as far north as 50°N latitude off British Columbia in summer (Pike and MacAskie 1969).

SYNONYMS. *Physeter catodon*.

OTHER COMMON NAMES. None.

SUBSPECIES. No subspecies are recognized although there are a number of separate breeding stocks. According to Bannister and Mitchell (1980), there are at least three stocks in the North Pacific: an eastern, a central and a western Pacific stock. The eastern stock occupies the Gulf of Alaska and the North American coast.

Family Ziphiidae — Beaked Whales

Genus *Berardius*

Two species are currently recognized: a North Pacific species and a southern hemisphere species. They show minor differences and further research may reveal that the two taxa are a single species (Honacki *et al.* 1982; Ross 1984).

Berardius bairdii Stejneger, 1883

North Pacific Bottle-nosed Whale

Stejneger, 1883. Proc. U.S. Nat. Mus. 6:75. Type Locality, eastern shore of Bering Island, Bering Sea, North Pacific Ocean. Type Specimen, USNM 20992.

B. bairdii inhabits the offshore waters of the North Pacific. In the eastern North Pacific there are records from the Pribilof Islands and Alaska south to California.

SYNONYMS. *Berardius vegae*.

OTHER COMMON NAMES. Baird's Beaked Whale, North Pacific Giant Bottlenosed Whale.

SUBSPECIES. No subspecies are recognized and no distinct stocks have been identified. However, geographic variation has not been assessed in this whale.

Genus *Mesoplodon*

There are eleven species in the genus; two are found in British Columbia waters. The genus was revised by Moore (1963, 1966).

Mesoplodon carlhubbsi Moore, 1963

Arch-beaked Whale

Moore, 1963. Amer. Midland Nat. 70:422. Type Locality, La Jolla, California, United States. Type Specimen, USNM 278031.

A North Pacific species, *M. carlhubbsi* is known only from waters off Japan in the western North Pacific; in the eastern North Pacific there are stranding records from San Diego to Prince Rupert (Mead *et al.* 1982).

SYNONYMS. None.

OTHER COMMON NAMES. Hubb's Beaked Whale.

SUBSPECIES. No subspecies are recognized. Populations in the western and eastern North Pacific are geographically separated but there have been no studies to determine if they represent distinct stocks.

Mesoplodon stejnegeri True, 1885

Bering Sea Beaked Whale

True, 1885. Proc. U.S. Nat. Mus. 8:585. Type Locality, Bering Island, Bering Sea, North Pacific Ocean. Type Specimen, USNM 21112.

Stranding records suggest that *M. stejnegeri* ranges across the North Pacific from Japan, through the Bering Sea, and south from Alaskan waters to California.

SYNONYMS. None.

OTHER COMMON NAMES. Stejneger's Beaked Whale.

SUBSPECIES. No subspecies or distinct stocks are recognized but, there has been no analysis of geographic variation.

Genus *Ziphius*

There is one species in the genus.

Ziphius cavirostris G. Cuvier, 1823

Goose-beaked Whale

Cuvier, 1823. Recherches sur les ossemens fossiles, ed. 2, 5(1):350. Type Locality, France. Type Specimen, Museum National d'Histoire Naturelle, Paris.

Widely distributed throughout temperate and tropical waters of all the world's oceans, strandings of *S. cavirostris* in the northeastern Pacific range from the Baja Peninsula to the Aleutian Islands (Mitchell 1968).

SYNONYMS. *Ziphius grebnitzkii*.

OTHER COMMON NAMES. Cuvier's Beaked Whale.

SUBSPECIES. No subspecies are recognized; it is unknown if there are distinct stocks. Mitchell (1968) described variation in skulls from the northeastern Pacific, but there has been no study of geographic variation throughout the range.

Order Artiodactyla — Even-toed Ungulates

Family Bovidae — Bovids

Genus *Bison*

The genus was revised by Skinner and Kaisen (1947) and McDonald (1981). One species inhabits North America. Van Zyll de Jong (1986) presented evidence that the North American Bison (*Bison bison*) and European Bison (*Bison bonasus*) are a single holarctic species.

Bison bison (Linnaeus, 1758)

Bison

The original range of *B. bison* covered much of the North American continent. Its prehistoric distribution in the province is not known precisely, but fossils and historical records suggest that it occupied the northern and eastern parts of the province and was absent from the southwest (Cowan and Guiguet 1965; van Zyll de Jong 1986). *B. bison* populations were drastically reduced during the 1700s and 1800s. By the twentieth century, free roaming herds in Canada were probably restricted to Wood Buffalo National Park. Herds are now established in various National Parks and on private land holdings. Free roaming bison now inhabit northeastern regions of the province. These animals originated from an introduction to the Pink Mountain area in 1971 and from animals that dispersed from herds in Alberta and the Northwest Territories.

SYNONYMS. *Bison americanus*, *Bos bison*.

OTHER COMMON NAMES. Buffalo, Plains Bison, Wood Bison.

SUBSPECIES. Historically, two distinct taxa of *B. bison* occurred in North America: a woodland morph that inhabited the boreal forest and parkland in western North America and a plains morph that was associated with the grasslands of central North America. Taxonomy of the two has been controversial, but most taxonomists treat them as separate subspecies: *Bison bison athabascae* (Wood Bison) and *Bison bison bison* (Plains Bison). In a comprehensive study of historical material applying multivariate methods, van Zyll de Jong (1986) demonstrated a morphological discontinuity between woodland and grassland populations in the grassland-forest ecotone of Saskatchewan, Alberta and northeastern British Columbia, and he concluded that the subspecies *B. b. athabascae* and *B. b. bison* are valid. Systematics of existing populations of *B. bison* has been complicated by the mixing of herds of the two races and hybridization (Reynolds *et al.* 1982; van Zyll de Jong 1986). Both subspecies now occur in northeastern British Columbia. Plains Bison (*B. b. bison*) were introduced to the Pink Mountain area. Wood Bison (*B. b. athabascae*) reported from various northeastern localities (e.g. Fort Nelson, Kotcho Lake) probably originated from *B. b. athabascae* introduced to Nahanni Butte, Northwest Territories, in 1980.

Bison bison athabascae

Original Description. Rhoads 1898. Proc. Acad. Nat. Sci. Phil. 49: 498.
Type Locality. Within 50 mi. (81 km) SW of Fort Providence, Northwest Territories.
Type Specimen. NMC 299.
Range. Originally inhabited northern British Columbia, Alberta, the southern Northwest Territories, the Yukon Territory and Alaska (McDonald 1981). There are records from the northern part of the province and the Peace River area, but the limited specimens available make it impossible to determine the exact historical range of this race in British Columbia. The Peace River area was evidently a transition zone between the two races. Specimens from this region studied by van Zyll de Jong (1986) showed some intermediate features between the two subspecies but they most closely resembled *B. b. athabascae*. Relatively "pure" forms have been preserved in various parks: Elk Island National Park, Alberta; Banff National Park, Alberta; Mackenzie Bison Sanctuary, Northwest Territories; Nahanni National Park, Northwest Territories. Individuals from Nahanni National Park have dispersed into northeastern British Columbia where there are records from Fort Nelson and Kotcho Lake.

Remarks. Present day remnant populations generally resemble the original *B. b. athabascae* but show some evidence of interbreeding with *B. b. bison* (van Zyll de Jong 1986).

Bison bison bison

Original Description. Linnaeus 1758. Syst. Nat. ed. 10,1:72.
Type Locality. Mexico.
Type Specimen. None designated.
Range. Originally distributed across central and eastern North America. The historical range in the province is unknown. Although it inhabited the Rocky Mountains of Alberta (McDonald 1981; van Zyll de Jong 1986), there is only one specimen record (Howse Pass, adjacent to Banff National Park) for British Columbia (Cowan and Guiguet 1965). Cowan and Guiguet (1965) and McDonald (1981) speculated that *B. b. bison* dispersed across the Rocky Mountains into southeastern British Columbia. "Pure" forms of this subspecies now exist in parks and private reserves. Several hundred *B. b. bison* now occupy the Pink Mountain area in British Columbia. They were transplanted from Elk Island National Park, Alberta, in 1971.

Genus *Oreamnos*

There is one species in the genus.

Oreamnos americanus (Blainville, 1816)

Mountain Goat

Blainville, 1816. Bull. Sci. Soc. Philomath., Paris, p. 80. Type Locality, Cascade Range, near Columbia River, in Oregon or Washington. Type Specimen, not known to exist.

Associated with the Cordillera of western North America, *O. americanus* ranges from southern Alberta, the Yukon Territory and the Northwest Territories to the northern Rocky Mountains in Montana and Idaho and the Cascade Mountains in Washington and Oregon. Except for the central interior, it occupies the entire mainland of the province. A population also occurs on Pitt Island.

SYNONYMS. *Mazama montanus*, *Oreamnos montanus*, *Rupricapra americana*.

OTHER COMMON NAMES. None.

SUBSPECIES. Traditionally, four subspecies were recognized with three occurring in British Columbia (Cowan and Guiguet 1965; Hall 1981). However, Cowan and McCrory (1970) found little geographic variation in cranial characters and they concluded that the use of subspecies is inappropriate.

Genus *Ovis*

Taxonomy of the genus is complex and there is considerable disagreement on the number of valid species. A general overview of the genus is given in Spillett and Bunch (1979). Two species are native to North America; both inhabit the province (Cowan 1940).

Ovis canadensis Shaw, 1804

Bighorn Sheep

Associated with the western Cordillera of North America, *O. canadensis* ranges from the Rocky Mountains of Canada and southcentral British Columbia to Mexico. It originally occupied the Rocky Mountains and the southern dry interior of the province; however, this range, particularly in the dry interior, has been reduced.

SYNONYMS. *Ovis californiana*, *Ovis californicana*, *Ovis californicus*, *Ovis canadensis similkameenensis*, *Ovis cervina*, *Ovis montana*.

OTHER COMMON NAMES. Mountain Sheep, California Bighorn Sheep, Rocky Mountain Bighorn Sheep.

SUBSPECIES. The species was revised by Cowan (1940) who recognized seven subspecies, two of which occur in the province: *O. c. canadensis* (Rocky Mountain Bighorn) and *O. c. californiana* (California Bighorn). Shackelton (1985), however, noted that *O. canadensis* is in need of a modern revision. The original distribution of the two races in the province has been altered by range reductions and transplants.

Ovis canadensis californiana

Original Description. Douglas 1829: Zool. J. 4:332.
Type Locality. Near Mount Adams, Yakima Co., Washington.
Type Specimen. BMNH 59.9.18.5.
Range. Originally, this race ranged from California to southern British Columbia where it occupied the Interior Plateau from the Thompson River Valley to the Chilcotin River and the Similkameen-Okanagan region (Sugden 1961). However, its range has been reduced. The small population north of Kamloops Lake was transplanted from the Chilcotin-Fraser herd in 1966.

Ovis canadensis canadensis

Original Description. Shaw 1804: Naturalists' Miscell. vol. 15:610.
Type Locality. Mountains on Bow River, near Exshaw, Alberta.
Type Specimen. Not known to exist.
Range. The Rocky Mountains from Alberta and British Columbia to Colorado. It inhabits the Rocky Mountains and Rocky Mountain trench in the province from the international border to Golden. Discontinuous populations occur in the Rocky Mountain region from Mount Robson to the Sukunka River. The small isolated populations at Spences Bridge and Squilax in the southern interior were transplanted from Banff in the 1920s.

Ovis dalli Nelson, 1884

Thinhorn Sheep

O. dalli inhabits northwestern North America: Alaska, the Yukon Territory, the Northwest Territories and northern British Columbia where it ranges as far south as Peace Reach, the eastern arm of Williston Lake. Although some taxonomists have suggested that *O. dalli* is conspecific with the morphologically similar Siberian Snow Sheep (*Ovis nivicola*), chromosome differences indicate that *O. dalli* and *O. nivicola* are distinct species (Korobitsyna *et al.* 1974).

SYNONYMS. *Ovis canadensis dalli*, *Ovis canadensis liardensis*, *Ovis canadensis nigra*, *Ovis canadensis stonei*, *Ovis dalli fannini*, *Ovis fannini*, *Ovis montana dalli*, *Ovis nivicola dalli*, *Ovis nivicola stonei*, *Ovis stonei*.

OTHER COMMON NAMES. Dall's Sheep, Black Sheep, Stone Sheep, White Sheep.

SUBSPECIES. In his revision, Cowan (1940) recognized three subspecies with two, *O. d. dalli* (Dall's Sheep) and *O. d. stonei* (Stone Sheep), occurring in the province. The two races are distinguished mainly by colour: *O. d. dalli* is white and *O. d. stonei* is dark. Colour variation in northeastern British Columbia and the southern Yukon Territory is complex and there is a broad region where intermediate colour morphs exist (Sheldon 1911; Cowan 1940; Youngman 1975). This has been interpreted as a zone of intergradation between the two races. Cowan (1940) suggested that the races *O. d. dalli* and *O. d. stonei* differ in size, but there has been no recent study of morphometric variation in *O. dalli* applying modern methods.

Ovis dalli dalli

Original Description. Nelson 1884: Proc. U.S. Nat. Mus. 7:13.
Type Locality. Mountains south of Fort Yukon, Yukon River, Alaska.
Type Specimen. Cotypes USNM 13266/20786 and USNM 13265/20787.
Range. Alaska, the Yukon Territory, the Northwest Territories and extreme northwestern British Columbia.
Remarks. The boundary delimiting the ranges of *O. d. dalli* and *O. d. stonei* in British Columbia and the Yukon Territory is somewhat arbitrary because of intermediate colour morphs. If *O. d. dalli* is defined as pure white then this race is restricted to the Haines Triangle region of the province.

Ovis dalli stonei

Original Description. Allen 1897: Bull. Amer. Mus. Nat. Hist. 9:111.
Type Locality. According to Cowan (1940), the Rainbow Mountains between the Stikine and Iskut rivers, British Columbia.
Type Specimen. AMNH 12721.
Range. The south-central Yukon Territory and northern British Columbia as far south as Peace Reach, Williston Lake and the Stikine and Iskut rivers.

Family Cervidae — Cervids

Genus *Alces*

The genus was revised by Peterson (1952, 1955); he recognized one species.

Alces alces (Linnaeus, 1758)

Moose

Widely distributed across the boreal regions of Eurasia and North America, *A. alces* occupies most of the province east of the coastal mountain ranges. *A. alces* has expanded its range dramatically in British Columbia during the past 60 to 80 years. Before 1900 it was absent from most of the southern part of the province.

SYNONYMS. *Alces americana*, *Alces americana andersoni*, *Alces americana gigas*, *Alces americana shirasi*, *Alces americanus*, *Alces americanus gigas*, *Alces americanus shirasi*, *Alces columbae*, *Alces gigas*.

OTHER COMMON NAMES. European Elk.

SUBSPECIES. In his revision, Peterson (1952) recognized four North American subspecies; three occur in the province. Morphometric data suggests a clinal pattern in size in North America with the largest moose inhabiting Alaska, the Yukon Territory and northwestern British Columbia. A modern study of geographic variation in this species is needed.

Alces alces andersoni

Original Description. Peterson 1950: Royal Ont. Mus. Zool. Occ. Paper 9:1.
Type Locality. Sprucewood Forest Reserve, 15 mi. (24 km) E of Brandon, Manitoba.
Type Specimen. ROM 20068.
Range. From northern Minnesota and Michigan to British Columbia, the Yukon Territory and the Northwest Territories. It occupies regions east of the coastal mountain ranges except for the extreme northwest and southeast.
Remarks. Youngman (1975) questioned the validity of this race and suggested that populations classified as *andersoni* represent intergrades between the other three races.

Alces alces gigas

Original Description. Miller 1899: Proc. Biol. Soc. Wash. 13:57.
Type Locality. North side of Tustumena Lake, Kenai Peninsula, Alaska.

Type Specimen. USNM 86166.

Range. Alaska, the Yukon Territory and northwestern British Columbia. According to Peterson (1952), specimens from Telegraph Creek and the Cassiar Mountains are intergrades between *A. a. gigas* and *A. a. andersoni*.

Alces alces shirasi

Original Description. Nelson 1914: Proc. Biol. Soc. Wash. 27:72.

Type Locality. Snake River, Lincoln Co., Wyoming.

Type Specimen. USNM 202973.

Range. Wyoming, Montana, Idaho, southwestern Alberta and southeastern British Columbia. Its precise range in the province is not clear. Peterson (1952) reported that it ranged as far north as Golden, but Cowan and Guiguet (1965) stated that it is restricted to the Rocky Mountain region south of Crowsnest Pass.

Genus *Cervus*

One species is native to North America; several Old World species were introduced to North America. A general overview of the genus is given in Groves and Grubb (1987).

Cervus dama Linnaeus, 1758

Fallow Deer

Originally, *C. dama* inhabited the Mediterranean region of southern Europe and the Middle East; however, it has been widely introduced to Europe, North America, Australia and New Zealand. In British Columbia, feral populations are found on Sidney and James islands. They originated from an introduction to James Island from England in the early 1900s. Subsequently, *C. dama* successfully colonized Sidney Island. Attempts to establish populations on Saltspring, Pender and Vancouver islands in the 1930s were unsuccessful.

SYNONYMS. *Dama dama*.

OTHER COMMON NAMES. None.

SUBSPECIES. Two races are recognized; populations introduced to British Columbia originated from *C. d. dama*.

Cervus dama dama

Original Description. Linnaeus 1758: Syst. Nat. 10,1:67.

Type Locality. Sweden (Introduced).

Type Specimen. None designated.

Range. Originally restricted to the Mediterranean region, it has been widely introduced to Europe, Australia, New Zealand and the New World.

Cervus elaphus Linnaeus, 1758

Elk

C. elaphus has a broad but disjunct distribution across Eurasia and North America. The original North American range has been greatly reduced (Bryant and Maser 1982). In British Columbia, there are populations on Vancouver Island and in the southern Kootenays and Rocky Mountains. It has been introduced to the southern interior and the Queen Charlotte Islands. Relationships between the Old World and New World forms have been controversial. Originally, New World and Siberian populations were classified as a separate species, *C. canadensis*, but most taxonomists now consider them to be a single species, *C. elaphus* (Bryant and Maser 1982).

SYNONYMS. *Cervus canadensis*, *Cervus canadensis roosevelti*, *Cervus canadensis nelsoni*, *Cervus merriami*, *Cervus nannodes*, *Cervus occidentalis*, *Cervus roosevelti*.

OTHER COMMON NAMES. Red Deer, Roosevelt Elk, Rocky Mountain Elk, Wapiti.

SUBSPECIES. Traditionally, six subspecies are recognized in North America (Bryant and Maser 1982); two occur in the province. Schonewald-Cox *et al.* (1985) assessed geographic

variation in skull morphology among populations from the Pacific coast, and Hutton (1972) analysed variation in skull and antler morphology in *C. canadensis nelsoni*. Nonetheless, there has been no comprehensive study of geographic variation throughout the entire North American range and the validity of six North American races is questionable (Groves and Grubb 1987). Taxonomy of existing North American populations has been modified by the historical extinction of two subspecies and translocations.

Cervus elaphus nelsoni

Original Description. Bailey 1935: Proc. Biol. Soc. Wash. 48:187.
Type Locality. Yellowstone National Park, Wyoming.
Type Specimen. USNM 49722/124656.
Range. Originally, this subspecies ranged throughout the Rocky Mountains from New Mexico to British Columbia and Alberta; however, its distribution has been reduced. In the province, it is found from the southern Kootenays to the northeast where relict herds occur as far north as the Liard River. *C. e. nelsoni* has been transplanted to various regions on the mainland (Bridge River, Naramata, Princeton, McNab Creek, Adams Lake, Lardeau, Christina Lake, Deer Park, Lytton) and to the Queen Charlotte Islands.
Remarks. Hutton (1972) found no statistical differences between the races *nelsoni* and *manitobensis*.

Cervus elaphus roosevelti

Original Description. Merriam 1897: Proc. Biol. Soc. Wash. 11:271.
Type Locality. Mount Elaine, Clallam Co., Washington.
Type Specimen. USNM 91579.
Range. Originally, this race extended from the San Francisco area of California north to southwestern British Columbia, but its historic range has been greatly reduced and its distribution is discontinuous. In British Columbia, *C. e. roosevelti* originally occupied Vancouver Island, possibly a few large adjacent islands and the lower Fraser Valley. Relict herds remain on Vancouver Island, but it has been extirpated from the mainland.
Remarks. Schonewald-Cox *et al.* (1985) demonstrated that the Vancouver Island population is strongly differentiated in skull morphology from mainland populations in Washington State and they noted that *C. e. roosevelti* may encompass several distinct morphs.

Genus *Odocoileus*

There are two species in the genus; both occur in the province. The genus was revised in part by Cowan (1936).

Odocoileus hemionus (Rafinesque, 1817)

Mule Deer

O. hemionus ranges across western North America from Mexico to southeastern Alaska. In British Columbia, it inhabits the entire mainland (except for some areas in the northwest), Vancouver Island and numerous coastal islands. Populations were introduced to the Queen Charlotte Islands in the early 1900s.

SYNONYMS. *Cervus columbianus*, *Cervus hemionus*, *Cervus macrotis*, *Cervus macrotus*, *Dama hemionus*, *Odocoileus columbianus*, *Odocoileus columbianus columbianus*, *Odocoileus columbianus sitkensis*.

OTHER COMMON NAMES. Black-tailed Deer, Sitka Deer.

SUBSPECIES. From 8 to 11 subspecies have been proposed (Cowan 1936, 1956; Wallmo 1981); 3 occur in the province. There is marked geographic variation with coastal populations, particularly in Alaska and British Columbia, strongly differentiated from interior populations in antler morphology, size and tail colour. In British Columbia, the coastal races, *O. h. sitkensis* (Sitka Deer) and *O. h. columbianus* (Black-tailed Deer), and the interior race, *O. h. hemionus* (Mule Deer),

represent extremes in a pattern of continuous variation. Some intergradation between coastal and interior races occurs in major valleys of the coastal mountain ranges, such as Bella Coola River, Hotnarko River and Pemberton valleys (Cowan 1936, 1956).

Odocoileus hemionus columbianus

Original Description. Richardson 1829: Fauna Boreali-Americana 1:257.
Type Locality. Cape Disappointment, Pacific Co., Washington.
Type Specimen. Not known to exist.
Range. The Pacific coast from California to central British Columbia where it occupies Vancouver Island, coastal islands and the coastal mainland as far east as the summit of the coastal mountain ranges. The northern limits of its range are somewhat arbitrary because of intergradation with the northern coastal race *O. h. sitkensis*, but Cowan (1956) and Cowan and Guiguet (1965) reported that it extended as far north as Rivers Inlet or Bella Bella.
Remarks. According to Cowan (1936), this race encompasses a wide range of geographic variation in the province with populations from Vancouver Island and the coastal islands smaller in body size than coastal mainland populations.

Odocoileus hemionus hemionus

Original Description. Rafinesque 1817: Amer. Monthly Mag. 1:436.
Type Locality. Sioux River, South Dakota.
Type Specimen. None designated.
Range. A large distribution across the Great Plains and western Cordillera of North America. In British Columbia, it occupies the entire mainland east of the summit of the coastal mountain ranges. In the extreme northwest, discontinuous populations are found in the Stikine River and Atlin Lake regions.

Odocoileus hemionus sitkensis

Original Description. Merriam 1898: Proc. Biol. Soc. Wash. 12:100.
Type Locality. Sitka, Alaska.
Type Specimen. USNM 74383.
Range. Coastal regions of southeastern Alaska and northern British Columbia where it occupies the coastal mainland from Bella Bella to Stewart. Discontinuous populations exist in the valleys of the Iskut, Unuk, Taku and Alsek-Tatshenshini rivers. This race also occupies many northern coastal islands in the province.
Remarks. *O. h. sitkensis* from Porcher Island was introduced to the Queen Charlotte Islands between 1900 and 1916; it is now widespread on the Charlottes. Differentiation in this introduced population has not been studied.

Odocoileus virginianus (Zimmermann, 1780)

White-tailed Deer

O. virginianus ranges from Canada to central South America. It is at the western periphery of its range in the province. Here, it is found in the Peace River area and in southeastern and south-central regions of the province.

SYNONYMS. *Cervus leucurus*, *Dama virginiana*, *Dama virginiana ochrourus*.

OTHER COMMON NAMES. None.

SUBSPECIES. Subspecies were reviewed by Kellogg (1956) who recognized 16 races in North America; 1 occurs in the province. There has been no modern study of geographic variation throughout the range.

Odocoileus virginianus ochrourus

Original Description. Bailey 1932: Proc. Biol. Soc. Wash. 45:43.
Type Locality. Coolin, Priest Lake, Bonner Co., Idaho.
Type Specimen. USNM 159353.
Range. Washington, Oregon, Idaho, Montana and British Columbia where it ranges from the Peace River to the Bulkley Valley in the north and from Golden to Merritt in the south.

Genus *Rangifer*

The genus was revised by Banfield (1961); one species is recognized.

Rangifer tarandus (Linnaeus, 1758)

Caribou

R. tarandus is associated with the boreal and tundra regions of Eurasia and North America. In British Columbia, it originally inhabited northern boreal and montane regions on the mainland and the Queen Charlotte Islands. The Queen Charlotte Islands population was extinct by the early 1900s. Mainland populations have been reduced in historical times and small relict herds exist at the southern periphery of its range in the province (Stevenson and Hatler 1985). Taxonomy of caribou-reindeer has been problematic and a number of named forms existed in the literature before the revision by Banfield (1961). Banfield (1961) treated all the New World and Old World populations as a single species; moreover, he classified the many geographic variants into a small number of subspecies.

SYNONYMS. *Rangifer arcticus dawsoni*, *Rangifer dawsoni*, *Rangifer montanus*, *Rangifer osborni*, *Rangifer tarandus montanus*, *Rangifer tarandus osborni*.

OTHER COMMON NAMES. Dawson's Caribou, Mountain Caribou, Reindeer, Woodland Caribou.

SUBSPECIES. Banfield (1961) recognized six subspecies in North America; two, *R. tarandus caribou* (Woodland Caribou) and *R. tarandus dawsoni* (Dawson's Caribou), are found in the province. *R. tarandus dawsoni* is extinct. Although Banfield (1961) grouped the North American Woodland Caribou and the Mountain Caribou into a single race *R. tarandus caribou*, he noted that these two morphs exhibit some differences in size, antler morphology and pelage colour. A modern study of geographic variation similar to the studies of arctic caribou by Thomas and Everson (1982) and Roed *et al.* (1986) is needed to resolve the systematics of woodland-mountain caribou.

Rangifer tarandus caribou

Original Description. Gmelin 1788: Syst. Nat. ed. 13, 1:177.
Type Locality. Quebec City, Quebec.
Type Specimen. None designated.
Range. Southeastern Alaska and the boreal regions of Canada from British Columbia and the Yukon Territory to Newfoundland. It ranges across the northern part of the province and as far south as Tweedsmuir Provincial Park and the southern Kootenays where populations are discontinuous.

Rangifer tarandus dawsoni

Original Description. Seton-Thompson 1900: Ottawa Nat. 13:257.
Type Locality. Virago Sound, Graham Island, Queen Charlotte Islands, British Columbia.
Type Specimen. RBCM 1483.
Range. Historically, this race is known only from Graham Island; its prehistoric distribution on the Queen Charlotte Islands is unknown. Banfield (1962) concluded that it became extinct shortly after 1910.

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APPENDIX

Checklist of Species and Subspecies of British Columbia Mammals

* taxa endemic to the province

ORDER MARSUPIALIA — Marsupials

Family: Didelphidae — New World Opossums

Didelphis virginiana (North American Opossum)
subspecies: *virginiana*

ORDER INSECTIVORA — Insectivores

Family: Soricidae — Shrews

Sorex arcticus (Black-backed Shrew)
subspecies: *arcticus*

Sorex bendirii (Pacific Water Shrew)
subspecies: *bendirii*

Sorex cinereus (Common Shrew)
subspecies: *cinereus*
streatori

Sorex hoyi (Pygmy Shrew)
subspecies: *hoyi*

Sorex monticolus (Dusky Shrew)
subspecies: *calvertensis**
elassodon
*insularis**
*isolatus**
longicauda
obscurus
*prevostensis**
setosus

Sorex palustris (Water Shrew)
subspecies: *brooksi**
navigator

Sorex trowbridgii (Trowbridge's Shrew)
subspecies: *trowbridgii*

Sorex tundrensis (Tundra Shrew)
subspecies: *tundrensis*

Sorex vagrans (Vagrant Shrew)
subspecies: *vagrans*

Family: Talpidae — Moles

Neurotrichus gibbsii (Shrew-mole)
subspecies: *gibbsii*

Scapanus orarius (Coast Mole)
subspecies: *schefferi*

Scapanus townsendii (Townsend's Mole)
subspecies: *townsendii*

ORDER CHIROPTERA — Bats

Family: Molossidae — Molossid Bats

Nyctinomops macrotis (Big Free-tailed Bat)
subspecies: none recognized

Family: Vespertilionidae — Vespertilionid Bats

Antrozous pallidus (Pallid Bat)
subspecies: *pallidus*

Eptesicus fuscus (Big Brown Bat)
subspecies: *bernardinus*

Euderma maculatum (Spotted Bat)
subspecies: none recognized

Lasionycteris noctivagans (Silver-haired Bat)
subspecies: none recognized

Lasiurus blossevilli (Southern Red Bat)
subspecies: *teliotis*

Lasiurus cinereus (Hoary Bat)
subspecies: *cinereus*

Myotis californicus (California Myotis)
subspecies: *californicus*
caurinus

Myotis ciliolabrum (Western Small-footed Myotis)
subspecies: *melanorhinus*

Myotis evotis (Western Long-eared Myotis)
subspecies: *evotis*
pacificus

Myotis keenii (Keen's Long-eared Myotis)
subspecies: none recognized

Myotis lucifugus (Little Brown Myotis)
subspecies: *alascensis*
carissima
lucifugus

Myotis septentrionalis (Northern Long-eared Myotis)
subspecies: none recognized

Myotis thysanodes (Fringed Myotis)
subspecies: *thysanodes*

Myotis volans (Long-legged Myotis)
subspecies: *longricus*

Myotis yumanensis (Yuma Myotis)
subspecies: *saturatus*
sociabilis

Plecotus townsendii (Townsend's Big-eared Bat)
subspecies: *pallescens*
townsendii

ORDER LAGOMORPHA — Lagomorphs

Family: Leporidae — Hares and Rabbits

Lepus americanus (Snowshoe Hare)
subspecies: *bairdii*
cascadensis
columbiensis
dalli

subspecies: *pallidus**
pineus
washingtonii

Lepus townsendii (White-tailed Jackrabbit)
subspecies: *townsendii*

Oryctolagus cuniculus (European Rabbit)
subspecies: none recognized

Sylvilagus floridanus (Eastern Cottontail)
subspecies: *alacer*
mearnsi

Sylvilagus nuttallii (Nuttall's Cottontail)
subspecies: *nuttallii*

Family: Ochotonidae — Pikas

Ochotona collaris (Collared Pika)
subspecies: none recognized

Ochotona princeps (Common Pika)
subspecies: *brooksi**
brunnescens
cuppes
fenisex
*littoralis**
princeps
*saturatus**
*septentrionalis**

ORDER RODENTIA — Rodents

Family: Aplodontidae — Mountain Beavers

Aplondontia rufa (Mountain Beaver)
subspecies: *rainieri*
rufa

Family: Arvicolidae — Voles and Lemmings

Clethrionomys gapperi (Southern Red-backed Vole)
subspecies: *athabascae*
cascadensis
*caurinus**
galei
occidentalis
phaeus
saturatus
stikinensis

Clethrionomys rutilus (Northern Red-backed Vole)
subspecies: *dawsoni*

Lemmus sibiricus (Brown Lemming)
subspecies: *helvolus*

Microtus longicaudus (Long-tailed Vole)
subspecies: *littoralis*
longicaudus
macurus
vellerosus

Microtus montanus (Montane Vole)
subspecies: *canescens*

Microtus oeconomus (Tundra Vole)
subspecies: *yakutatensis*

Microtus oregoni (Creeping Vole)
subspecies: *serpens*

Microtus pennsylvanicus (Meadow Vole)
subspecies: *drummondii*
modestus

Microtus richardsoni (Water Vole)
subspecies: *arvicoloides*
richardsoni

Microtus townsendii (Townsend's Vole)
subspecies: *cowani**
*cummingi**
*laingi**
*tetramerus**
townsendii

Ondatra zibethicus (Muskrat)
subspecies: *osoyoosensis*
spatulata

Phenacomys intermedius (Heather Vole)
subspecies: *intermedius*
*laingi**
levis
mackenzii
oramontis

Synaptomys borealis (Northern Bog Lemming)
subspecies: *artemisiae**
borealis
chapmani
dalli
truei

Family: Castoridae — Beavers

Castor canadensis (Beaver)
subspecies: *canadensis*
belugae
leucodontus
sagittatus

Family: Cricetidae — Cricetids

Neotoma cinerea (Bushy-tailed Woodrat)
subspecies: *cinerea*
drummondii
occidentalis

Peromyscus maniculatus (Deer Mouse)
subspecies: *algidus*
*alpinus**
artemisiae
austerus
borealis
*cancrivorous**
*keenii**
*macrorhinus**
*maritimus**
*pluvialis**
*rubriventer**

Peromyscus oreas (Columbian Mouse)
subspecies: *interdictus**
*isolatus**
oreas

Peromyscus sitkensis (Sitka Mouse)
subspecies: *prevostensis**

Reithrodontomys megalotis (Western Harvest Mouse)
subspecies: *megalotis*

Family: Erethizontidae — New World Porcupines

Erethizon dorsatum (Porcupine)
subspecies: *myops*
nigrescens

Family: Geomyidae — Pocket Gophers

Thomomys talpoides (Northern Pocket Gopher)
subspecies: *cognatus**
fuscus
*incensus**
medius
saturatus
*segregatus**

Family: Heteromyidae — Heteromyids

Perognathus parvus (Great Basin Pocket Mouse)
subspecies: *laingi**
lordi

Family: Muridae — Murids

Mus musculus (House Mouse)
subspecies: *domesticus*

Rattus norvegicus (Norway Rat)
subspecies: not applicable

Rattus rattus (Black Rat)
subspecies: not applicable

Family: Myocastoridae — Myocastorids

Myocastor coypus (Nutria)
subspecies: not applicable

Family: Sciuridae — Squirrels

Glaucomys sabrinus (Northern Flying Squirrel)
subspecies: *alpinus*
columbiensis
fuliginosus
laticeps
oregonensis
*reductus**
zaphaeus

Marmota caligata (Hoary Marmot)
subspecies: *caligata*
cascadensis
okanagana
oxytona
*raceyi**

Marmota flaviventris (Yellow-bellied Marmot)
subspecies: *avara*

Marmota monax (Woodchuck)
subspecies: *canadensis*
ochracea
petrensis

*Marmota vancouverensis** (Vancouver Island Marmot)
subspecies: none recognized

Sciurus carolinensis (Gray Squirrel)
subspecies: *pennsylvanicus*

Sciurus niger (Fox Squirrel)
subspecies: not applicable

Spermophilus columbianus (Columbian Ground Squirrel)
subspecies: *columbianus*

Spermophilus lateralis (Golden-mantled Ground Squirrel)
subspecies: *tescorum*

Spermophilus parryii (Arctic Ground Squirrel)
subspecies: *plesius*

Spermophilus saturatus (Cascade Mantled Ground Squirrel)
subspecies: none recognized

Tamias amoenus (Yellow-pine Chipmunk)
subspecies: *affinis*
felix
ludibundus
luteiventris
*septentrionalis**

Tamias minimus (Least Chipmunk)
subspecies: *borealis*
caniceps
oreocetes
*selkirki**

Tamias ruficaudus (Red-tailed Chipmunk)
subspecies: *ruficaudus*
simulans

Tamias townsendii (Townsend's Chipmunk)
subspecies: *cooperi*
townsendii

Tamiasciurus douglasii (Douglas' Squirrel)
subspecies: *mollipilosus*

Tamiasciurus hudsonicus (Red Squirrel)
subspecies: *columbiensis*
*lanuginosus**
petulans
picatus
preblei
richardsoni
streatori

Family: Zapodidae — Jumping Mice

Zapus hudsonius (Meadow Jumping Mouse)
subspecies: *alascensis*
hudsonius
*tenellus**

Zapus princeps (Western Jumping Mouse)
subspecies: *idahoensis*
kootenayensis
saltator

Zapus trinotatus (Pacific Jumping Mouse)
subspecies: *trinotatus*

ORDER CARNIVORA — Carnivores

Family: Canidae — Canids

Canis latrans (Coyote)
subspecies: *incolatus*
lestes

Canis lupus (Gray Wolf)
subspecies: *columbianus*
*crassodon** (no longer exists)
fuscus (no longer exists)
irremotus (no longer exists)
ligoni

Vulpes vulpes (Red Fox)
subspecies: *abietorum*
cascadensis
macroura

Family: Felidae — Cats

Felis concolor (Cougar)
subspecies: *oregonensis*
missoulensis
*vancouverensis**

Lynx canadensis (Lynx)
subspecies: none recognized.

Lynx rufus (Bobcat)
subspecies: *fasciatus*
pallescens

Family: Mustelidae — Mustelids

Enhydra lutris (Sea Otter)
subspecies: *lutris*

Gulo gulo (Wolverine)
subspecies: *luscus*
*vancouverensis**

Lontra canadensis (River Otter)
subspecies: *mira*
pacifica
*periclyzomae**

Martes americana (Marten)
subspecies: *abietinoides*
actuosa
caurina
*nesophila**

Martes pennanti (Fisher)
subspecies: *columbiana*
pacifica

Mephitis mephitis (Striped Skunk)
subspecies: *hudsonica*
spissigrada

Mustela erminea (Ermine)
subspecies: *anguinae**
fallenda

*haidarum**
invicta
richardsonii

Mustela frenata (Long-tailed Weasel)
subspecies: *altifrontalis*
nevadensis
oribasus

Mustela nivalis (Least Weasel)
subspecies: *rixosa*

Mustela vison (Mink)
subspecies: *energumenos*
*evagor**

Spilogale putorius (Spotted Skunk)
subspecies: *latifrons*

Taxidea taxus (Badger)
subspecies: *jeffersonii*

Family: Otariidae — Eared Seals

Callorhinus ursinus (Northern Fur Seal)
subspecies: none recognized

Eumetopias jubatus (Northern Sea Lion)
subspecies: none recognized

Zalophus californianus (California Sea Lion)
subspecies: *californianus*

Family: Phocidae — Hair Seals

Mirounga angustirostris (Northern Elephant Seal)
subspecies: none recognized

Phoca vitulina (Harbor Seal)
subspecies: *richardsi*

Family: Procyonidae — Procyonids

Procyon lotor (Raccoon)
subspecies: *pacificus*
*vancouverensis**

Family: Ursidae — Bears

Ursus americanus (Black Bear)
subspecies: *altifrontalis*
*carlottae**
cinnamomum
*kermodei**
*vancouveri**

Ursus arctos (Grizzly Bear)
subspecies: *horribilis*

ORDER CETACEA — Whales

Family: Balaenidae — Right Whales

Balaena glacialis (Right Whale)
subspecies: *japonica*

Family: Balaenopteridae — Rorquals

Balaenoptera acutorostrata (Minke Whale)
subspecies: *davidsoni*

Balaenoptera borealis (Sei Whale)
subspecies: *borealis*

Balaenoptera musculus (Blue Whale)
subspecies: *musculus*

Balaenoptera physalus (Fin Whale)
subspecies: *physalus*

Megaptera novaeangliae (Humpback Whale)
subspecies: none recognized

Family: Delphinidae — Delphinids

Delphinus delphis (Saddle-backed Dolphin)
subspecies: none recognized

Globicephala macrorhynchus (Short-finned Pilot Whale)
subspecies: none recognized

Grampus griseus (Risso's Dolphin)
subspecies: none recognized

Lagenorhynchus obliquidens (Pacific White-sided Dolphin)
subspecies: none recognized

Lissodelphis borealis (Northern Right-whale Dolphin)
subspecies: none recognized

Orcinus orca (Killer Whale)
subspecies: none recognized

Pseudorca crassidens (False Killer Whale)
subspecies: none recognized

Stenella coeruleoalba (Striped Dolphin)
subspecies: none recognized

Family: Eschrichtiidae — Gray Whales

Eschrichtius robustus (Gray Whale)
subspecies: none recognized

Family: Phocoenidae — Porpoises

Phocoena phocoena (Harbor Porpoise)
subspecies: none recognized

Phocoenoides dalli (Dall's Porpoise)
subspecies: none recognized

Family: Physeteridae — Sperm Whales

Kogia simus (Dwarf Sperm Whale)
subspecies: none recognized

Physeter macrocephalus (Sperm Whale)
subspecies: none recognized

Family: Ziphiidae — Beaked Whales

Berardius bairdii (North Pacific Bottle-nosed Whale)
subspecies: none recognized

Mesoplodon carlhubbsi (Arch-beaked Whale)
subspecies: none recognized

Mesoplodon stejnegeri (Bering Sea Beaked Whale)
subspecies: none recognized

Ziphius cavirostris (Goose-beaked Whale)
subspecies: none recognized

ORDER ARTIODACTYLA — Even-toed Ungulates

Family: Bovidae — Bovids

Bison bison (Bison)
subspecies: *athabascae*
bison

Oreamnos americanus (Mountain Goat)
subspecies: none recognized

Ovis canadensis (Bighorn Sheep)
subspecies: *californiana*
canadensis

Ovis dalli (Thinhorn Sheep)
subspecies: *dalli*
stonei

Family: Cervidae — Cervids

Alces alces (Moose)
subspecies: *andersoni*
gigas
shirasi

Cervus dama (Fallow Deer)
subspecies: *dama*

Cervus elaphus (Elk)
subspecies: *nelsoni*
roosevelti

Odocoileus hemionus (Mule Deer)
subspecies: *columbianus*
hemionus
sitkensis

Odocoileus virginianus (White-tailed Deer)
subspecies: *ochrourus*

Rangifer tarandus (Caribou)
subspecies: *caribou*
*dawsoni** (extinct)

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